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HIT AND RUN

FOR 26 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

LUDLOW-SAYLOR

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

for super-severe service

●

SUPER-HARD, SUPER-TOUGH, SUPER-STRONG

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

withstand abrasion longer—

endure vibration better—

resist fatigue to the utmost

The background at top of page shows the "perfect" Double-Crimp Weave.

The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.

The border at foot of page shows "perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.

Samples on request.

The LUDLOW-SAYLOR WIRE COMPANY SAINT LOUIS

EASTON TLC-6 — TIER-LIFT ELECTRIC TRUCK CAPACITY — 6,000 LBS. SERVING THE NAVY AND OTHER ARMED FORCES, ALSO WAR INDUSTRIES. BULLETIN 162.

EASTON MODEL 1614 — INDUSTRIAL TRAILER. CAPACITY — 30,000 LBS. EASTON TRAILERS ARE HANDLING GUNS AND SHELLS IN MUNITIONS PLANTS. BULLETINS 191 AND 192.

EASTON ROCKER DUMP TRAILER SIMILAR UNITS ARE SERVING AIRCRAFT AND OTHER WAR INDUSTRIES ALSO ROCKER DUMP CARS

Keep moving WITH EASTON

Public Library
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VICTORY MODEL ELECTRIC TRUCKS

★ To help conserve critical materials EASTON has limited production of electric trucks to six standard government-approved models: the low-lift, the tier-lift, the low-platform and the high-platform trucks of 4,000 pounds capacity; and the 6,000 pound low-lifts and tier-lifts. Let EASTON engineers demonstrate how one of these six basic models can be adapted to your requirements.

INDUSTRIAL CARS AND TRAILERS

★ EASTON cars and trailers are used in almost every industrial haulage operation — handling raw materials at their source, moving parts and finished products through production processes, speeding up work at distribution centers. Capacities range from 4,000 pounds to 250 tons. Every EASTON car and trailer is a Victory Model, using fewer critical materials wherever possible and built from the ground up for "E-Plant" efficiency.

ENGINEERING COUNSEL

★ EASTON specializes in engineered material handling equipment designed to meet specific operating conditions. For new ideas in material handling, for repairs, or for replacements write to: Engineering Counsel, Easton Car & Construction Company, Easton, Pennsylvania.

B-1003

BELOW: EASTON DOUBLE-BODIED TANDEM SEMI-TRAILER. ON SEMI-TRAILERS SEE BULLETINS Nos. 173 AND 175.

PIT AND QUARRY, May, 1943, Vol. 35, No. 11. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago, Ill. Subscription price $2 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 50 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.

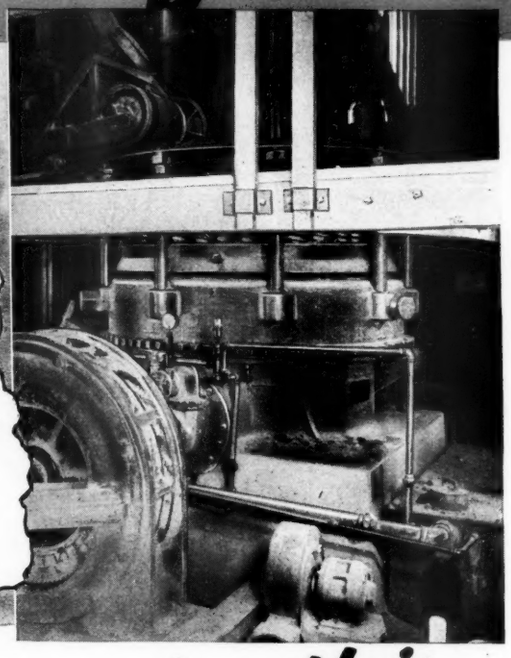
THESE THREE SABOTEURS *failed!*

"We are sending you under separate cover, one eight pound hammer head and two picks which passed through our Secondary Crusher on Sept. 18, 1942, without apparently doing any damage.

This is such a remarkable demonstration of the power and efficiency of your 48" TELSMITH Gyrasphere Secondary Crusher, that we feel you should have these specimens as proof of the statement. This machine at the time was set for one-half inch discharge, which makes the demonstration more remarkable.

We get a large percentage of tramp iron * * * In the past this was a source of grave trouble but since installing your machine tramp iron doesn't bother us."

NAME ON REQUEST



they didn't even stop this

TELSMITH

Gyrasphere SECONDARY CRUSHER

A silent, skulking saboteur—Tramp Iron constantly menaces your production. Get the insurance against shut-downs of Telsmith's *spring relief*. The crusher's concave bowl is backed by heavy springs, adjustable as to compression. When tramp iron gets in, it causes undue pressure in the crushing bowl. The springs let the concave bowl *tilt* at the point of stress. The pressure is relieved. The concave resumes its normal position. Crushing goes on as usual. The same relief is afforded when crusher bowl is packed by fines. This means a greatly increased capacity in fine crushing, continuous operation and minimum upkeep. *For the whole story, get Bulletin Y-15.*

Y-3

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

Room 1604—50 East 42nd St. New York City
211 W. Wacker Drive Chicago, Ill.
713 Commercial Trust Bldg. Philadelphia, Pa.
19-21 Charles St. Cambridge, Mass.
Blake Equipment Co. Columbus, Ohio
Brandeis M. & S. Co. Louisville, Ky.
Charleston Tractor & Eqpt. Corp. Charleston, W. Va.
Roanoke Trac. & Eqpt. Co. Roanoke, Va.
Clift L. Preister 911 S. 3rd St., Memphis, Tenn.
Wilson-Weesner-Wilkinson Co. Knoxville and Nashville, Tenn.
G. F. Seeley & Co. Toronto, Ont.

Just 3 Words

PLEDGED
CONSTRUCTION
EQUIPMENT
CONSERVATION

—but what a whale of a lot they mean!

Photo courtesy of Broderick & Bascom Rope Co.

C-o-n-s-t-r-u-c-t-i-o-n

E-q-u-i-p-m-e-n-t

C-o-n-s-e-r-v-a-t-i-o-n

. . . that sums up a big part of today and tomorrow's job

- New construction equipment is hard to get—that means you'll have to take care of what you have.
- Time-consuming breakdowns must be avoided as much as possible; emergency repairs must be made quickly, and frequently without the usual type of critical materials and parts.
- Jobs *must* be completed on time or ahead of schedule—that means extra work—faster, more skillful operation.

How About You?

Have you joined the ranks of the hundreds of owners and operators who are doing their darndest to do more with what they've got . . . to make their equipment last longer and work faster? You can tell these men by this 5" red, white and blue emblem on their trucks, tractors, bulldozers, shovels, cranes and scrapers. If you want to show others that *you* are conserving, write for one or more of these free emblems today.

THE THEW SHOVEL COMPANY
Lorain, Ohio

THEW-LORAIN CRANES • SHOVELS DRAGLINES • MOTO-CRANES

STEP UP EQUIPMENT OUTPUT . . .

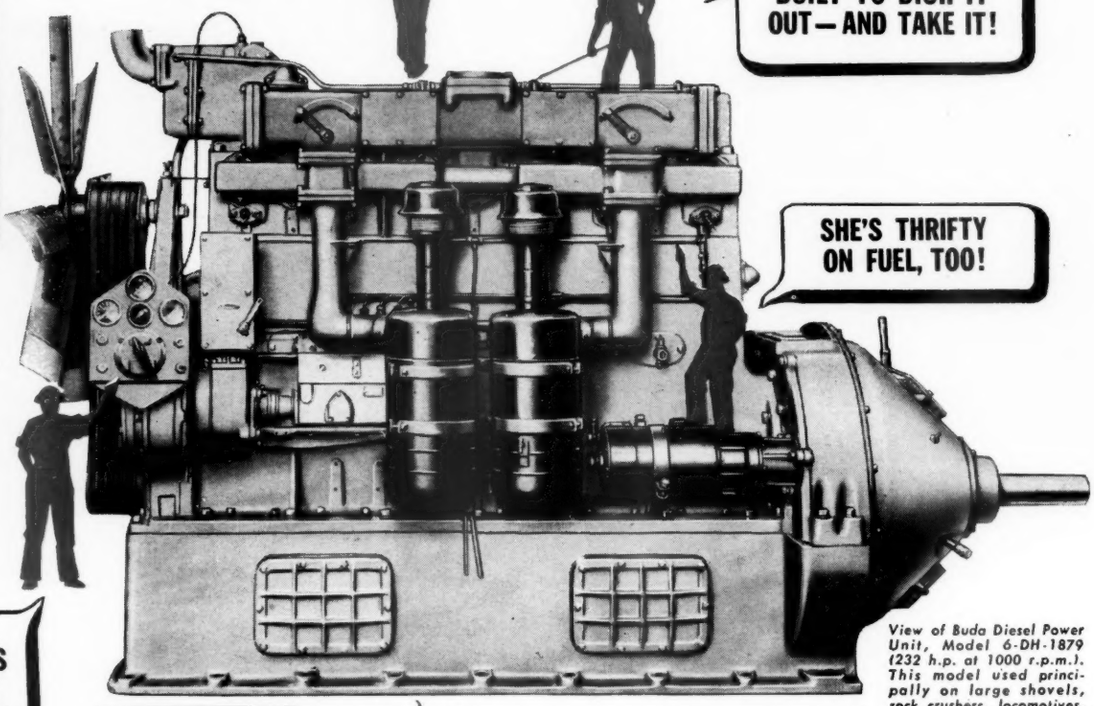
put BUDA POWER *on the job!*

NO VIBRATION!

THAT BABY WILL CUT OUR DOWNTIME FOR ENGINE REPAIRS PLENTY!

SHE'S REALLY BUILT TO DISH IT OUT—AND TAKE IT!

SHE'S THRIFTY ON FUEL, TOO!



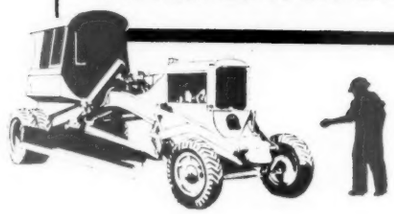
View of Buda Diesel Power Unit, Model 6-DH-1879 (232 h.p. at 1000 r.p.m.). This model used principally on large shovels, rock crushers, locomotives, etc.

ALL I DO IS TURN THIS SWITCH AND SHE STARTS!

85% OF THE PARTS ON THIS ENGINE ARE NON-WEARING!

JOE MECHANIC

THERE'S A BUDA ENGINE TO FIT YOUR JOB — SIZES RUN FROM 20 TO 340 H.P.



TAKE YOUR PICK — BUDA BUILDS 'EM FOR DIESEL, GASOLINE, BUTANE OR NATURAL GAS!

REMEMBER THIS!

BUDA

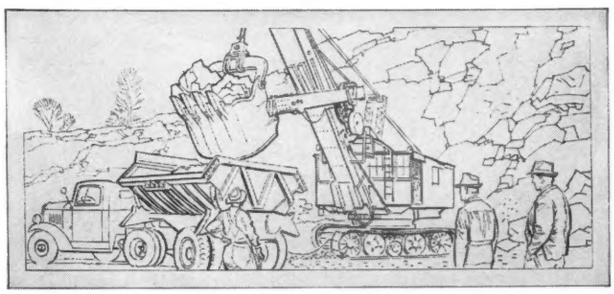
MORE POWER PER DOLLAR

THE BUDA COMPANY

HARVEY (Chicago Suburb) ILLINOIS

GASOLINE and DIESEL ENGINES—20 to 340 H.P.

Gulf Quality Lubricants have greater stability and endurance — provide the round-the-clock protection you need for maximum production.



NOW that spare parts and new production units are hard to get even with high priorities, protection from wear of hard-pressed equipment now in service has become in many cases a No. 1 management problem.

For a successful fight against wear in *your* quarry or plant, here are some of the more important steps you can take today: Make sure that all shafts, bearings, and gears are properly aligned; that provision is made to keep all moving parts clean; and call in a Gulf Lubrication Service Engineer to help you install the best lubrication practice.

From Gulf's complete line, the Gulf Lubrication Service Engineer will recommend oils and greases especially manufactured to meet the present day needs of quarries and cement plants—lubricants with greater stability and stamina, that stand up and provide round-the-clock protection for your equipment. Result: full capacity production from every unit, a minimum of production lags caused by breakdowns and mechanical troubles, and lower expense for maintenance and repairs.

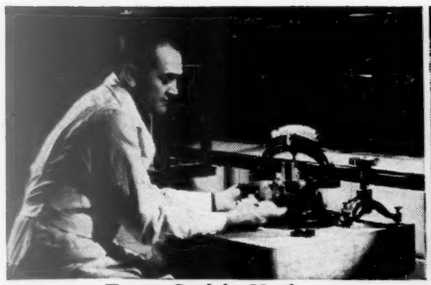
The helpful counsel of a Gulf Lubrication Service Engineer—and the Gulf line of more than 400 quality lubricants—are available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write or 'phone your nearest Gulf office today.

GULF OIL CORPORATION—GULF REFINING COMPANY

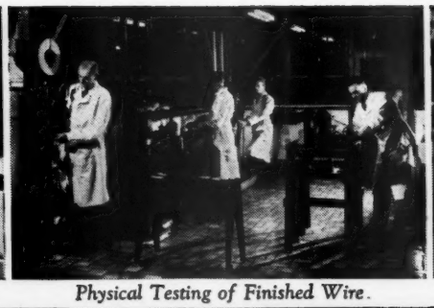
GULF BUILDING, PITTSBURGH, PA.

GULF INDUSTRIAL LUBRICATION

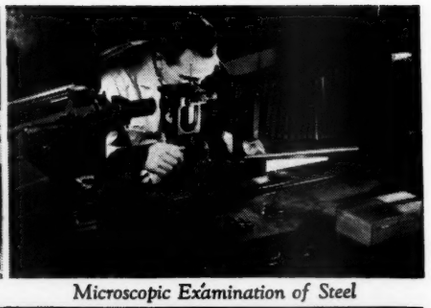
FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS



Testing Steel for Hardness



Physical Testing of Finished Wire.



Microscopic Examination of Steel

A Section of Union Wire Rope Research Laboratory

★Another 6 Months of Star Performance In War Production

BIRTHPLACE OF TOUGHNESS

Out of some 4000 steel formulas, relatively few are suited to wire rope making. From long years of experience, Union Wire Rope engineers and metallurgists have determined upon a steel formula for each type of Union Wire Rope.

To be certain each heat meets specified analysis, steel is examined under a powerful microscopic photo and scanning machine (see photo at top right). In minute detail its micro structure and inherent grain size are analyzed. From this analysis is determined the controlled heat-treatment and the subsequent processing operations it is to be given in the mill to secure wire meeting the exact specifications desired.

Samples of the wire then are brought back into the elaborate Union Wire Rope laboratory. First it is subjected to hardness tests under a delicate pendulum machine (see left photo above) and its Brinell hardness determined. Then in a group of six physical testing machines (see photo at top center) the actual tenisle strength, torsional values, fatigue life, ductility and hardness of wires of all grades and sizes are checked. Here, before the wire is stranded, the ultimate tensile strength, toughness and durability of Union Wire Rope is pre-determined.

Many other research activities are constantly carried on in Union Wire Rope's laboratory. Although not pictured here, there are scientific research machines for testing wire coatings by the salt spray, Preece, strip test and wrap test methods.

Here tough wire is born and on long lines of stranding machines (many of them designed by our own engineers) it grows into Union Wire Rope of maximum strength and greater toughness to withstand harder use and longer service.

UNION WIRE ROPE CORPORATION
2132 Manchester Ave., Kansas City, Mo.
Tulsa • Houston • Chicago • Salt Lake City • New Orleans • Monahans Portland • Ashland, Ky. • Atlanta

B-43

SEND FOR ROPE DOPE • Tells how to make wire rope last longer—how to handle and install it—how to socket or splice—and a wealth of other helpful information.

WHEN YOU NEED PREFORMED WIRE ROPE
SPECIFY **union-formed**

union *Wire Rope*
"THE ULTIMATE LOW COST WIRE ROPE"

Operators of Rear-Dump and Bottom-Dump EUCLIDS, as well as those who service these units, make up a mighty important "task force" on the production front. Their jobs may lack the glory and adventure of action on the fighting front, but they're vital to victory just the same.

By careful operation and regular servicing to keep the "Eucs" rolling day in and day out, these men are helping to supply our mills and war plants with the coal, iron, aluminum, limestone and other materials that bring victory closer. Other jobs, too—airports, bases, military roads, etc.,—are being completed in record time by Euclids and the men who drive them and keep 'em running.

The EUCLID ROAD MACHINERY CO. • • CLEVELAND, OHIO

EUCLID

SELF-POWERED HAULING EQUIPMENT

For EARTH . . ROCK . . COAL . . ORE

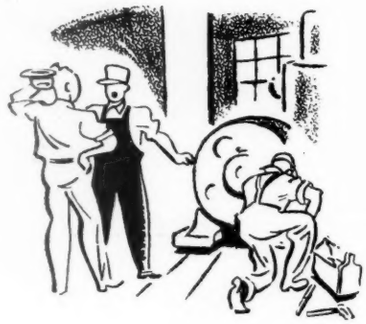
CRAWLER WAGONS • ROTARY SCRAPERS • TAMPING ROLLERS

EUCLID THE PIONEER

What's Your No

Here are 6 of the Most Important

1 UNEXPECTED BREAKDOWNS?



How many of your key machines were designed for 24-hour-day service?

2 LOW-GRADE DEPOSITS?

Has increased wartime demand brought new processing problems?

3 LABOR SHORTAGE?

Does part of your process use men unnecessarily? Crushing is a *machine* industry!

In modern laboratories trained engineers analyze materials on machines like this X-ray spectrograph — there's no guesswork when you come to Allis-Chalmers.

WHICHEVER IT IS —

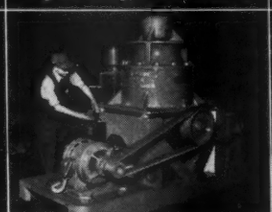
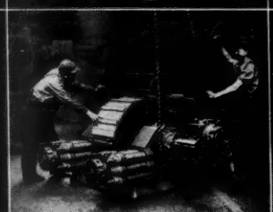
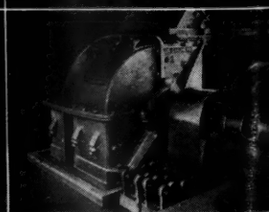
CALL ON

HERE'S SOMETHING for every crushing man to lean on these days — and lean on *hard* . . . Allis-Chalmers Cooperative Engineering. There's nothing else like it! Here's why . . .

Because it's hard to get new machinery these days, often old equipment must be made to do the job. And that's where Allis-Chalmers' vast experience and "know-how" can help you. Making all types, complete lines of equipment, our engineers analyze your problem from the viewpoint of your entire production process.

That means that Allis-Chalmers engineers are

Only Allis-Chalmers Makes a Complete Line of this Equipment!

Jaw Crushers	Gyratory Crushers	Crushing Rolls	Pulverators
			
All-steel primary and fine reduction. ¼"-12" product.	High-speed primary and secondary. 3" to 60" size feed.	6 different types. Reduction ratios from 5-1 to 10-1.	"Multi-impact" reduces non-abrasives to cubical shape.

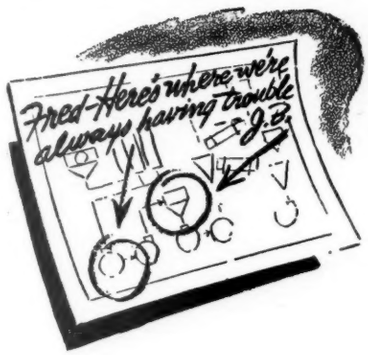
o . 1 Headache? . .

Problems facing Processors today —

4 LAGGING SCHEDULES?

Maybe you have a bottleneck machine—an added machine would load up other units.

5 OBSOLETE MACHINERY?



Much equipment that "got by" in peacetime needs too much maintenance today.

6 OVERWORKED ENGINEERS?

Outside engineering cooperation may be all that's needed to get you out of a hole.

N ALLIS-CHALMERS!

"complete line" engineers . . . familiar with every step in the basic processes. They know how vital it is for various machines to team-up properly — and know how to *achieve* that team-work!

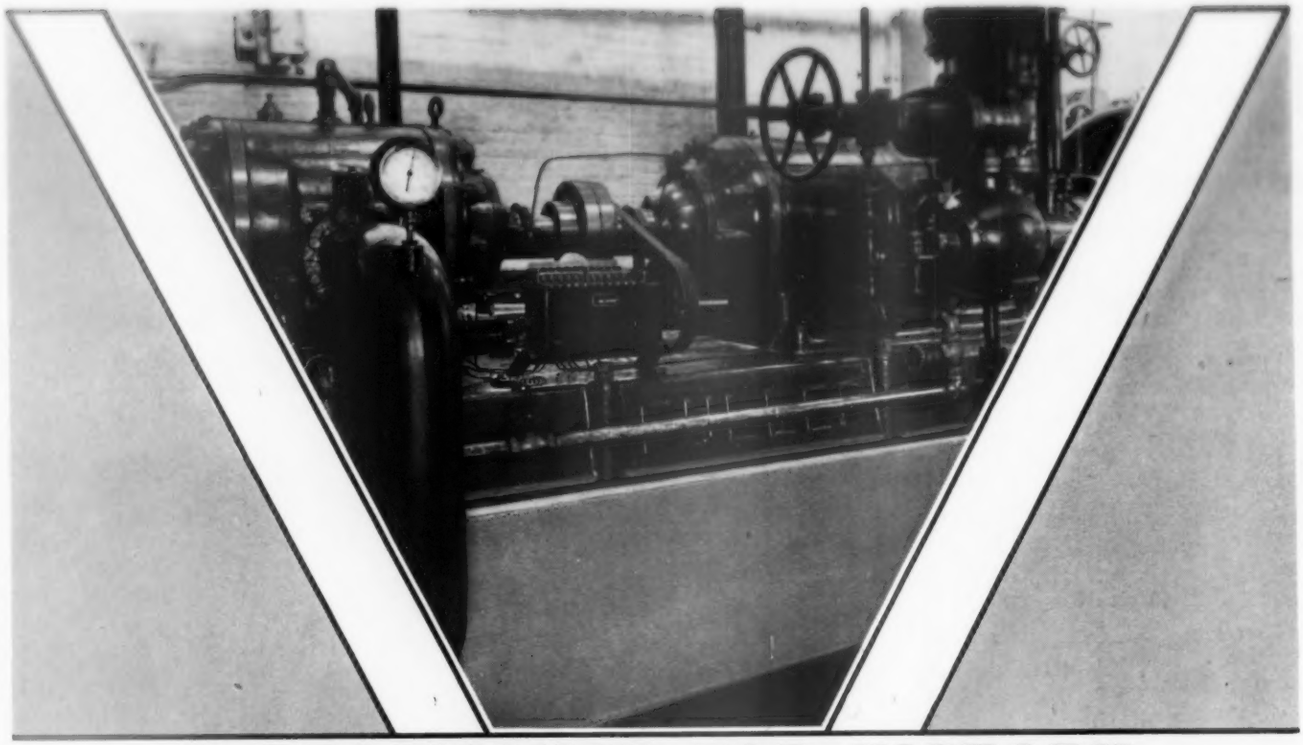
And they don't have to push any one type of equipment . . . because Allis-Chalmers builds *all* types — *eight* types of screen, for example, not just one or two types!

Result: Allis-Chalmers engineers have the same point of view as *your* engineers. Their objective is to give you precisely *the* right equipment for your particular needs!

Whether you have a big or a small problem, Allis-Chalmers Cooperative Engineering is yours for the asking — with no strings attached. Write, wire or 'phone your nearby Allis-Chalmers district office. Or write ALLIS-CHALMERS MFG. CO., MILWAUKEE, WIS.

A 1561-A

ors	Blade Mills	Vibrating Screens	Log & Sand Washers	Motors & Drives	Centrifugal Pumps
uces non-shape.	For washing and disintegration of materials up to 12".	Efficient separation and dewatering — 8 different types.	All-welded modern units for materials up to 3½" size.	Unbeatable team—Lo-Maintenance Motor & Texrope V-belts.	Largest line, highest efficiencies — built with motors.



PERFORMANCE FOR VICTORY

AND PEACE-TIME PRODUCTION

Fuller Rotary Compressors are doing their part in a big way to win the victory and, after that, they'll still be on the firing line for peace-time production. They're working day and night in cement and steel plants, foundries, shipyards, alcohol, aircraft, and chemical plants, gas and oil refineries. They're built to take it and performance records prove their worth.

One plant engineer in a war industry writes: "It is now approaching the third year of continuous operation for your two-stage compressor, (1800 C.F.M., 100-lb. pressure), during which time we are glad to report that the service load factor has been in the neighborhood of 99.9 per cent."

FULLER ROTARY COMPRESSORS

Another—"Your two-stage compressor, (100 C.F.M., 90-lb. pressure), has run 23 hours per day almost continuously for four years and has given no trouble." Not a cent was spent for repairs during these four years.

In a foundry—during three years' operation only $3.90 was spent for repairs on a two-stage compressor, (330 C.F.M., 100-lb. pressure).

Performance such as this will help to gain a more speedy victory. And, after that, they'll still give you many years of efficient performance at minimum operating expense with capacities maintained for the life of the machine.

C-86

FULLER COMPANY

CATASAUQUA — PENNSYLVANIA

CHICAGO—Marquette Bldg. SAN FRANCISCO—Chancery Bldg.

HE KNOWS HIS BUSINESS

He operates a power shovel and delivers top performance because he knows how.

We manufacture industrial friction materials that are *correct* and *dependable* because we know how.

When you specify Raybestos you get brake linings and frictions of 38 years proven quality and performance, *specially engineered* to meet the exact requirements of every machine that you operate.

Raybestos can supply *all* your friction material needs. And fastest deliveries are assured through your local Raybestos distributor. See him or wire us.

THE RAYBESTOS DIVISION of ***Raybestos-Manhattan, Inc.*, BRIDGEPORT, CONN.**

RAYBESTOS IS AMERICA'S BIGGEST SELLING BRAKE LINING

Raybestos INDUSTRIAL FRICTION MATERIALS

FOR SHOVELS • CRANES • HOISTS • TRACTORS & EARTH MOVERS

FOR CORROSIVE LOCATIONS. These oil-immersed combinations are made in two forms —for both corrosive and hazardous locations.
DUST-TIGHT COMBINATIONS. Available through NEMA size 5—these starters are for application in dusty locations
NEW HIGH-VOLTAGE COMBINATION. This provides split-cycle short-circuit protection and starting means for high-voltage motors.

GENERAL ELECTRIC

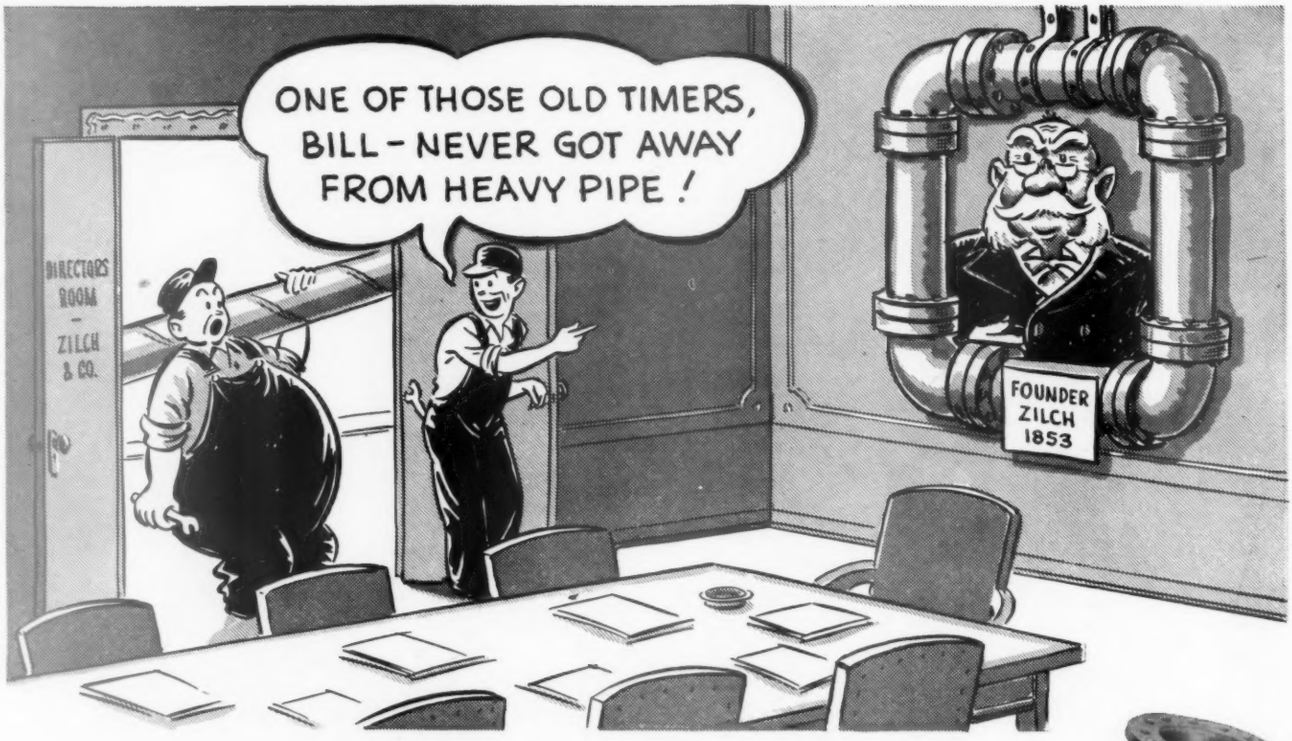
676-93C-8490

PRINT IN BI

HEY BILL!
YOU'RE DOUBLING YOUR WORK WHEN YOU INSTALL CONTROL THAT WAY!
EVER HEAR OF G-E COMBINATION MOTOR STARTERS?
By using G-E combination starters, you can cut the time required to install motor control by 50 per cent. That's because "combinations" combine two controls—a motor-circuit switch (with short-circuit protection) and a magnetic starter—in one, compact, easy-to-mount unit.
But that isn't all—combination starters save critical material by eliminating unnecessary conduit; and they offer your operators better protection because the case door is interlocked with the safety switch.
Save man-hours and critical material by specifying General Electric combination starters. General Electric Company, Schenectady, N. Y.
WATERTIGHT COMBINATIONS For outdoor application and for installation in damp locations.
FOR HAZARDOUS LOCATIONS Enclosed in a high-strength, alloy case, these starters are ideal for Class 1, Group D, locations.
FOR GENERAL-PURPOSE USE These combinations are for indoor applications where atmospheric conditions are normal.

OMBINATION STARTERS FOR MOTORS FROM 1 TO 1000 HP

T IN BINDING



But Modern Folks have swung over to Taylor Spiral Pipe!

EVERY time the need arises for pipe in your plant, ask yourself whether it isn't one of those jobs that can be taken care of with a lighter wall pipe than you have been using. If you do this, we believe you will be surprised to find how often the answer is Taylor Spiral Pipe.

Consider the services listed opposite, for instance. These are the kind of applications for which Standard Thickness Pipe is so often used. And yet it has been conclusively proved in hundreds of plants that light-wall-but-rugged Taylor Spiral Pipe can handle jobs of this kind with strength and service life to spare.

Such plants have simply gotten away from the old custom of using Standard Thickness Pipe for all "run-of-mine" piping needs. And by so doing they have in many cases cut the installed cost of moderate and low pressure piping squarely in half.

This big saving is the only reason you would need for changing to Taylor Spiral Pipe for much of *your* moderate and low pressure piping. But today you have an even better reason—the conservation of steel, for Taylor Spiral Pipe contains far less steel than the Standard Thickness pipe it so well replaces. Yes, Taylor Spiral gives you just about all that you can ask for in pipe *plus* maximum saving in dollars and maximum conservation of steel.

Changing to Taylor Spiral Pipe for services like those listed is made easy by the complete range of sizes and wide variety of fittings. Thicknesses range from 18 to 6 gauge; sizes from 4" to 42"; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies, are produced by Taylor Forge, assuring a complete service and undivided responsibility.

Change to TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines.
- Low Pressure Steam and Air Lines.
- Steam and Diesel Exhaust Lines.
- Vacuum and Suction Lines.
- Blower Piping.
- Sand and Gravel Lines.
- Industrial Gas Lines.
- Oil and Gas Gathering Lines.
- Swing Pipe.
- Spray Pond Piping.
- Hydraulic Mining.
- Dredge Lines.

TAYLOR FORGE & PIPE WORKS, General Offices & Works: Chicago, P. O. Box 485
New York Office: 50 Church Street • Philadelphia Office: Broad Street Station Building

TAYLOR *Spiral* PIPE

BELTING AND HOSE WITH "THE THUMB"

Aristotle said: "The superiority of man over animals lies in the hand; the superiority over men, in the thumb."

For the movement of materials and transmission of power by belts and hose and the control of power by industrial brake lining, Thermoid Products have that extra something that is symbolized by the thumb.

Thermoid builds these products with an approach that is unusual. Thermoid engineers and production technicians have a realistic viewpoint. They visualize these products in use in the field rather than as just so much footage or poundage going through a plant. No wonder Thermoid Industrial Rubber Products have an outstanding performance record—they are born with the extra serviceability symbolized by the thumb.

When the order carries the name "Thermoid", every executive from the top to the bottom knows that the Purchasing Department is giving Production the best that can be had.

P.S. In line with material conservation, Thermoid has prepared a series of bulletins on how to extend the life of rubber products now in use. You might find them helpful as reminders to your operating people. Feel free to ask for copies.

THE THERMOID LINE INCLUDES: Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products.

Thermoid Rubber

DIVISION OF THERMOID CO.
TRENTON, NEW JERSEY

IT'S GOOD BUSINESS TO DO BUSINESS WITH THERMOID

The Care and Feeding of Rock Crushers

No. 4 of a series of advertisements published in the interests of national economy and to aid those users of crushing equipment unable to secure new units during the emergency.

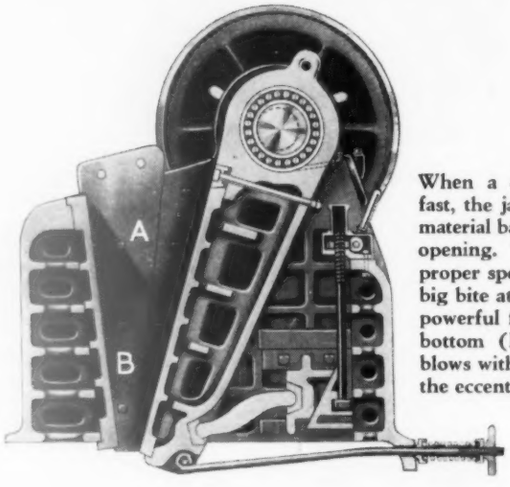
What Operating Speed for Maximum Output?

As with a gasoline or diesel engine, there is an ideal speed at which crushers will provide maximum efficiency. Operating below that range may provide increased crushing efficiency at the expense of volume; and operating above that range may provide decreased crushing efficiency and decreased volume, because of choking and premature wear of the jaws and other parts.

Crushers should be operated within the range of speeds indicated on the name plate. Universal engineers are familiar with all sorts of rock, ores and slags and are glad to be consulted where special cases indicate higher or lower than standard operating speeds.

When a crusher is run too fast it will not grip the rock. This results in slippage and causes rapid wear of the jaws. Do not operate on the theory that every revolution of the eccentric shaft gives a crushing blow and, therefore, increased capacity.

There is a peak speed which, when exceeded, causes decreased production. Therefore, the increased speed over the peak is wasteful and wears out equipment much faster. *At high speeds, rock floats in the crusher and jaws cannot grip it readily.*



When a crusher is run too fast, the jaws tend to squeeze material back up into the feed opening. When run at the proper speed, the jaws take a big bite at the top (A) and a powerful finishing bite at the bottom (B) — two crushing blows with each revolution of the eccentric shaft.

The "Overhead Eccentric" crushing principle, pioneered by Universal, gives maximum production.

We've earned this WAR BOND buyer's flag to help keep "Old Glory" flying!

UNIVERSAL ENGINEERING CORP.
Formerly Universal Crusher Co.
619 C Ave. West Cedar Rapids, Iowa

UNIVERSAL
CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

P&H

ELECTRIC SHOVELS

DIGGING IN THE WAY THAT COUNTS!

WHETHER it's limestone, coal, or any of the metallic ores so urgently needed in war production — swift, steady digging is essential to produce today's larger volumes.

To assure it, every detail of design and construction in these P&H Electric Shovels follows the most approved and advanced engineering practices.

Continuous operation and lower costs per ton are the result of P&H's sixty years' experience in the application of electric power to the handling of heavy loads.

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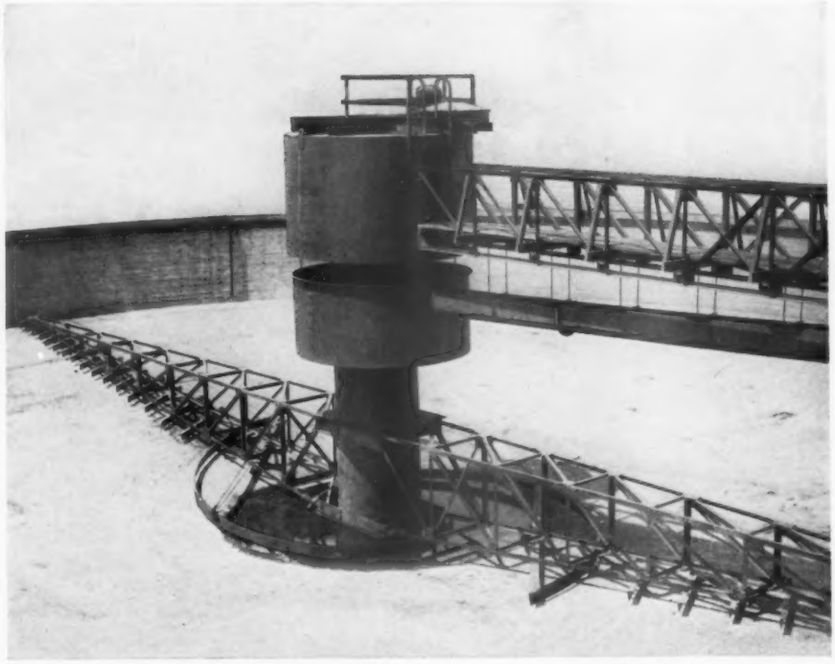
HARNISCHFEGER
CORPORATION
EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

General Offices; 4585 West National Avenue
Milwaukee, Wis.



AN IMPORTANT ADVANCE IN LARGE CENTER PIER THICKENER DESIGN

HARDINGE EQUIPMENT

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Thickeners	31-C

Illustrated here is the latest in large Thickener developments. It is the "Toggle Type Auto-Raise" center pier Thickener.

An overload anywhere in the tank bottom, regardless of whether at the rim or near the center, will actuate the raising mechanism. The entire scraping mechanism raises as a unit, thus eliminating stresses which cannot be controlled if only part of the scraping mechanism is relieved.

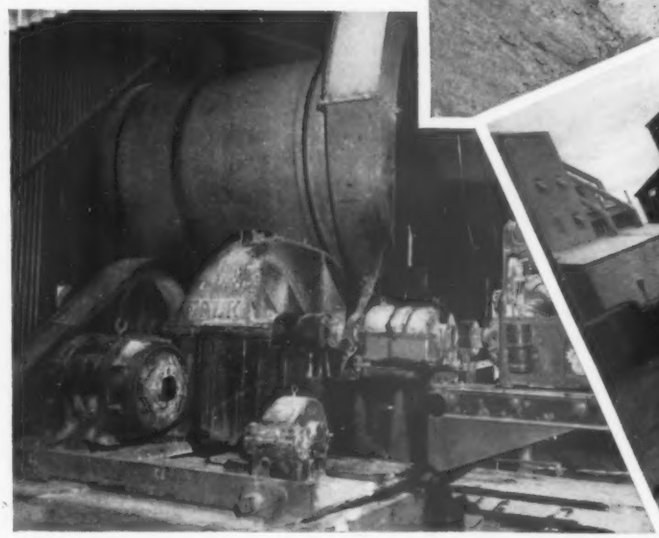
Write for our Thickener Bulletin 31-C

HARDINGE

COMPANY, INCORPORATED - YORK, PENNSYLVANIA

122 East 42nd Street, New York, N. Y.
205 West Wacker Drive, Chicago, Illinois
501 Howard Street, San Francisco, California
200 Bay St., Toronto, Ontario, Canada

AT NATIONAL GYPSUM COMPANY



WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

THE FOLLOWING LIST OF EQUIPMENT BY TRAYLOR AT BELLEFONTE IS NOTEWORTHY AND SIGNIFICANT

1—8'-6" dia. x 7'-0" x 400'-0" Rotary Kiln
1—8'-0" dia. x 425'-0" Rotary Kiln
1—5'-6" dia. x 42'-0" Rotary Cooler
1—7'-6" dia. x 44'-0" Rotary Cooler
2—Traylor-Cheeseman Burners
1—16" Bulldog Gyratory Crusher
1—8" Bulldog Gyratory Crusher
2—3'-6" x 9'-0" Heavy Duty Feeders
1—60" dia. x 24'-0" Open End Rotary Screen

TRAYLOR

ENGINEERING & MANUFACTURING CO.

MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

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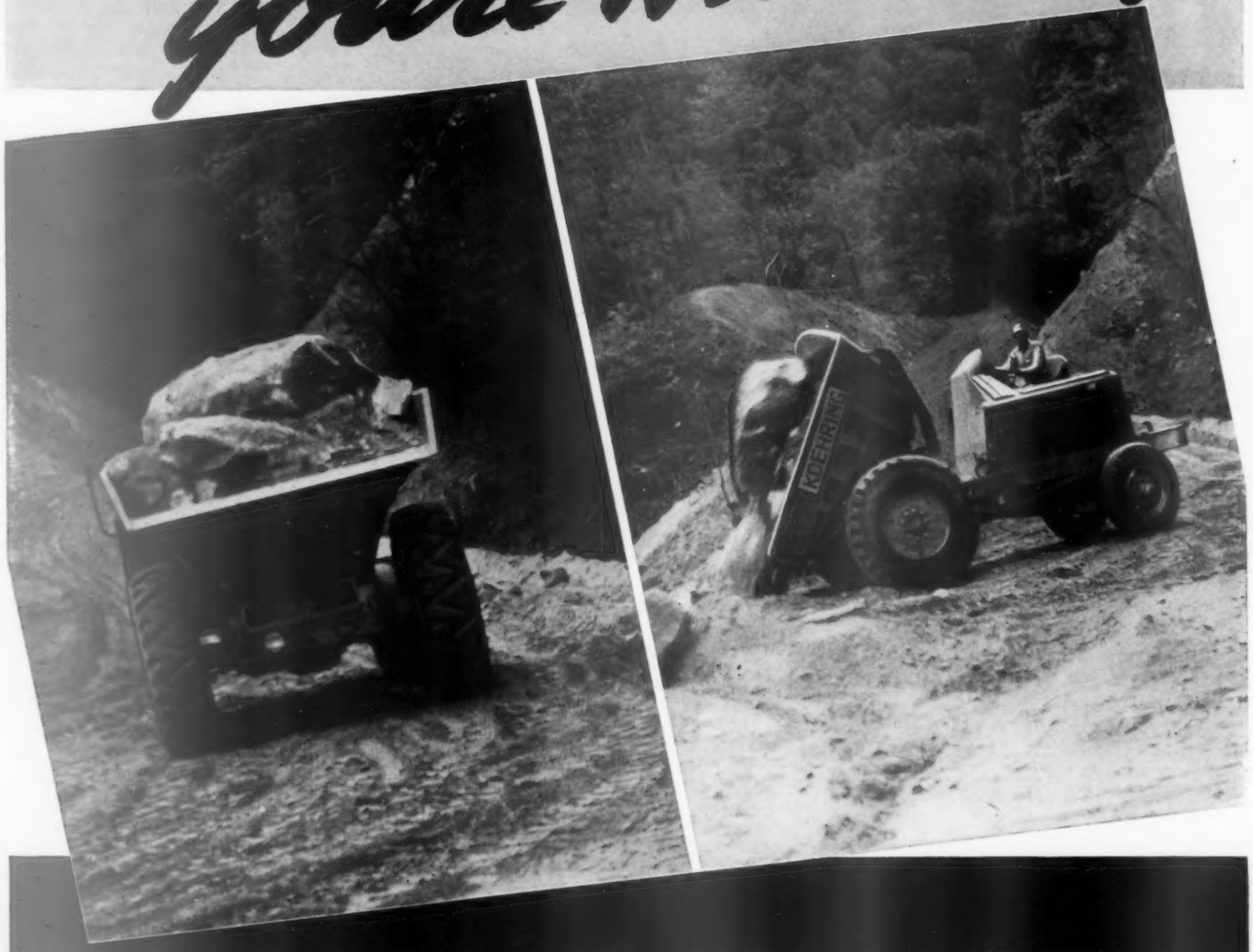
B. C. EQUIPMENT CO., LTD.
551 Howe St., Vancouver, B. C.

Export Department — 104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Rio de Janeiro, Buenos Aires, Santiago, Autofagasta, Oruro, Montevideo

If it's Rock you're Hauling



KOEHRING DUMPTORS ARE YOUR BEST BET

Here is good pictorial proof that Koehring Dumptors can haul and dump rock of any reasonable size and come speeding back for more. Wide body opening means easy loading, and gravity dumping is instantaneous. The massive chassis easily withstands the shock of constant heavy duty service. Koehring Dumptors will save you valuable time too, with three speeds in either direction, quick load spotting and dumping up to the edge of the fill. Haul rock faster with a Koehring Dumptor.

Your Koehring Dumptor will last much longer with proper lubrication and care . . . depend on your Koehring equipment distributor and use genuine Koehring parts.

KOEHRING COMPANY • *Milwaukee, Wis.*

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

How to Increase Stripping Efficiency

This veteran LeTourneau 10-yard Carryall, stripping a South African gypsum pit, digs, hauls and dumps its own loads in a continuous operating cycle. Carryall cleans off overburden right down through last few inches, eliminates unnecessary mixing of materials and saves screening time at the plant.

Use LeTourneau Carryall Scrapers

You can speed materials output and reduce non-productive shovel and dragline time by using LeTourneau Carryall Scrapers for initial overburden removal. On such stripping work, you'll find that LeTourneau Carryalls:

(1) strip and get big loads just as efficiently along a 6-inch layer of overburden as they do on a 30-foot layer, due to ability of Scrapers to make thin, horizontal cuts,

(2) accurately strip off even the last few inches, without mixing materials, thus save screening unnecessary waste at the plant,

(3) permit low-cost recovery of isolated deposits too costly to reclaim with big shovels and draglines,

(4) dump overburden back from pit, beyond slide danger, or *permanently* out of the way to eliminate any need for rehandling.

Many Other Uses, Too

In addition, scores of ingenious pit and quarry operators use LeTourneau Carryalls for such jobs as: loading rooted material, building roads, moving spoil banks, dumping through grizzlies, stockpiling, levelling, etc.

Long-Lived Construction

Try your LeTourneau Carryalls on all these time-and-money-saving jobs. On your toughest assignments, stout welded steel construction holds Carryall repairs to a minimum. Even then, most repairs can be made on the job with a welding torch; no long, expensive shutdowns.

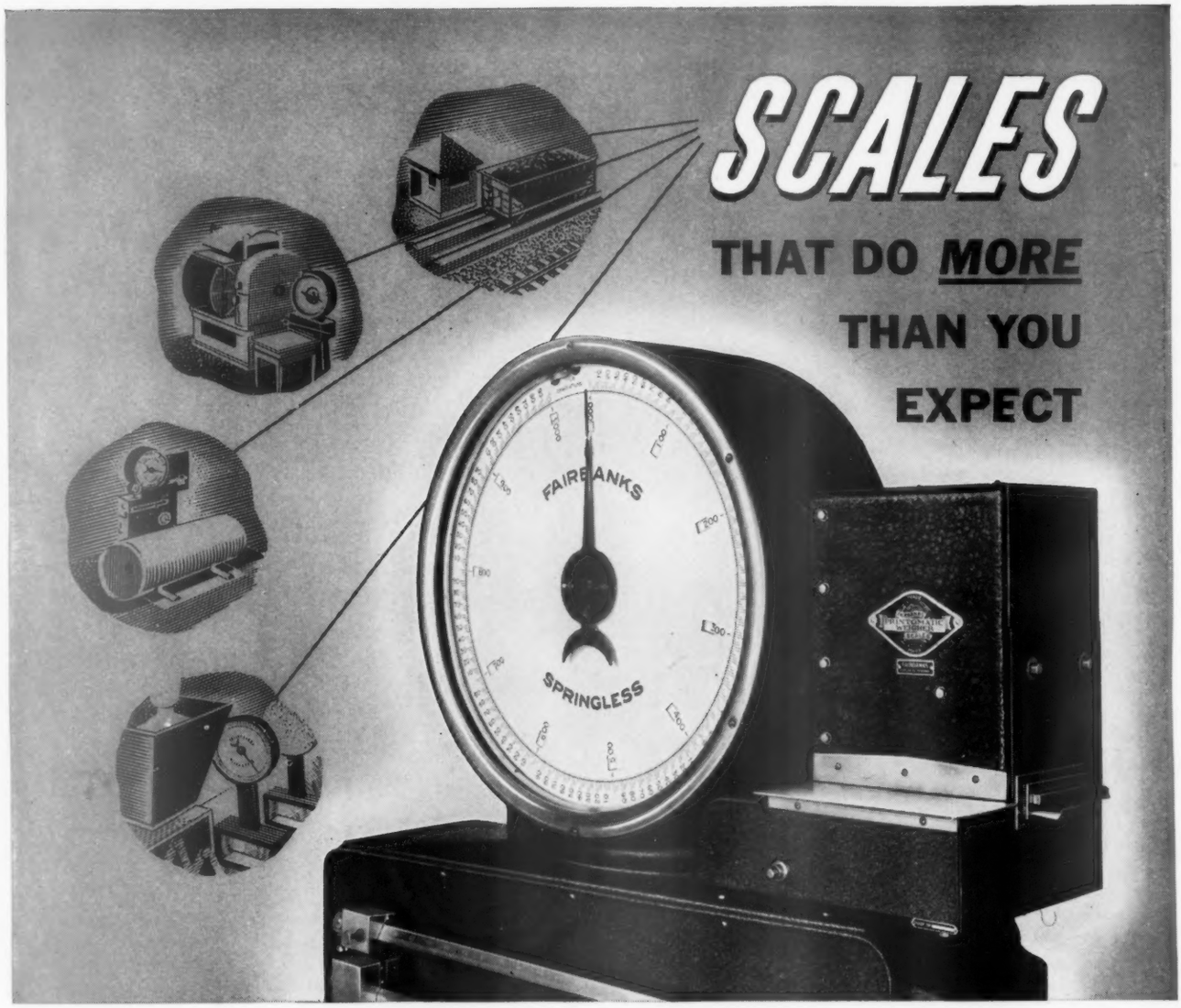
Prompt Dealer Service

. . . And you have the added advantage of time-saving service and repair parts from LeTourneau-"Caterpillar" dealers in strategic cities the world over. All these things give you more productive minutes per hour . . . enable you to increase your output at lower cost for VICTORY.

For Powerful Performance Use LeTourneau P.C.U.'s

Like all LeTourneau stripping and materials-handling equipment, Carryall Scrapers are operated by means of cable from LeTourneau job-proved Power Control Units. You get instant, powerful operation in all temperatures; no leaky hoses, no oil to thin and bypass with heat or slow up and stop in sub-zero temperatures. Easy, safe to operate. Simple to adjust. Same standard 2-drum Power Unit used for Carryall also operates LeTourneau Dozer, Rooter or Crane, thus takes your tractor out of the one-use class. Over 30,000 LeTourneau P. C. U.'s sold to date—more than any other 4 makes combined.

(Below) Part of a huge fleet of 30 LeTourneau Carryalls being used to strip as much as 110 feet of overburden from one of America's biggest bauxite mines, in the Midwest. Pusher tractor remains in pit, helps each tractor-Scraper unit get bigger loads in sticky clay faster.



OF course, Fairbanks Scales are big, husky, and accurate. You have a right to expect these things in *any* good scale—and particularly of Fairbanks Scales with the world's broadest scale manufacturing experience behind them.

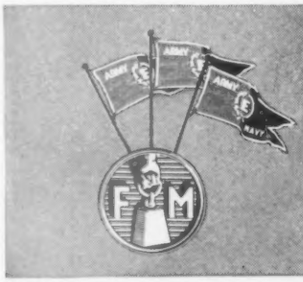
The feature about Fairbanks Scales that may surprise you the most, is their ability to do things you *don't* expect of scales.

Here are a few of many jobs done by Fairbanks Scales:

- They count small parts—more accurately than manual counting
- They weigh carloads of coal in motion and make a printed record of each weight
- They automatically control paint ingredients
- They automatically control aggregates
- They "keep the books" in steel plants, making printed records of incoming and outgoing shipments
- They keep accurate records on chlorination in water treatment
- They record the *flow* of liquid chemicals
- They guard secret formulas in compounding
- They control batching in bakeries
- They prevent disputes by eliminating the human element in weighing.

AND all of these things, only the beginning of the story, they do automatically and mechanically thereby eliminating human errors.

How Fairbanks Scales can be fitted into your production flow to speed up operations and eliminate errors may prove to be the most interesting discovery you ever made. Investigate now. Write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Illinois.



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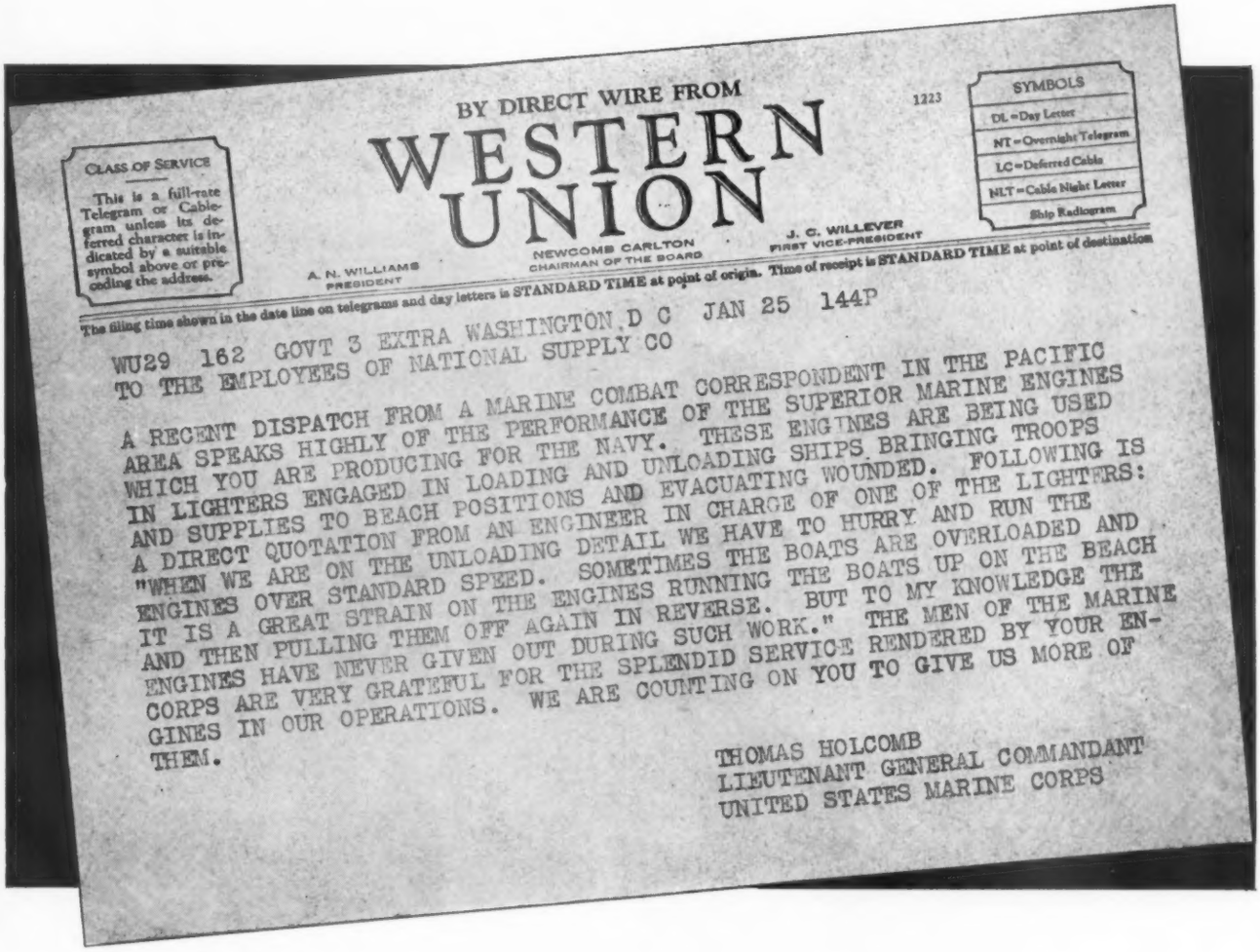
MOTORS
GENERATORS
SCALES

WATER SYSTEMS
FARM EQUIPMENT
STOKERS
AIR CONDITIONERS
RAILROAD EQUIPMENT

FAIRBANKS SCALES

Scales

Thank You, General Holcomb!



BY DIRECT WIRE FROM

WESTERN UNION

1223

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TO THE EMPLOYEES OF NATIONAL SUPPLY CO

A RECENT DISPATCH FROM A MARINE COMBAT CORRESPONDENT IN THE PACIFIC AREA SPEAKS HIGHLY OF THE PERFORMANCE OF THE SUPERIOR MARINE ENGINES WHICH YOU ARE PRODUCING FOR THE NAVY. THESE ENGINES ARE BEING USED IN LIGHTERS ENGAGED IN LOADING AND UNLOADING SHIPS BRINGING TROOPS AND SUPPLIES TO BEACH POSITIONS AND EVACUATING WOUNDED. FOLLOWING IS A DIRECT QUOTATION FROM AN ENGINEER IN CHARGE OF ONE OF THE LIGHTERS: "WHEN WE ARE ON THE UNLOADING DETAIL WE HAVE TO HURRY AND RUN THE ENGINES OVER STANDARD SPEED. SOMETIMES THE BOATS ARE OVERLOADED AND IT IS A GREAT STRAIN ON THE ENGINES RUNNING THE BOATS UP ON THE BEACH AND THEN PULLING THEM OFF AGAIN IN REVERSE. BUT TO MY KNOWLEDGE THE ENGINES HAVE NEVER GIVEN OUT DURING SUCH WORK." THE MEN OF THE MARINE CORPS ARE VERY GRATEFUL FOR THE SPLENDID SERVICE RENDERED BY YOUR ENGINES IN OUR OPERATIONS. WE ARE COUNTING ON YOU TO GIVE US MORE OF THEM.

THOMAS HOLCOMB
LIEUTENANT GENERAL COMMANDANT
UNITED STATES MARINE CORPS

WE ARE very proud that our Superior Diesels have measured up to the high standards of the tough Marines they serve.

We, the men and women of Superior, pledge the fullest measure of our effort that you may have the engines you need to hit the enemy again and again, *in his own territory,* until complete and final Victory is won.

EMPLOYEES OF

THE NATIONAL SUPPLY CO.

***Superior* ENGINE DIVISION**

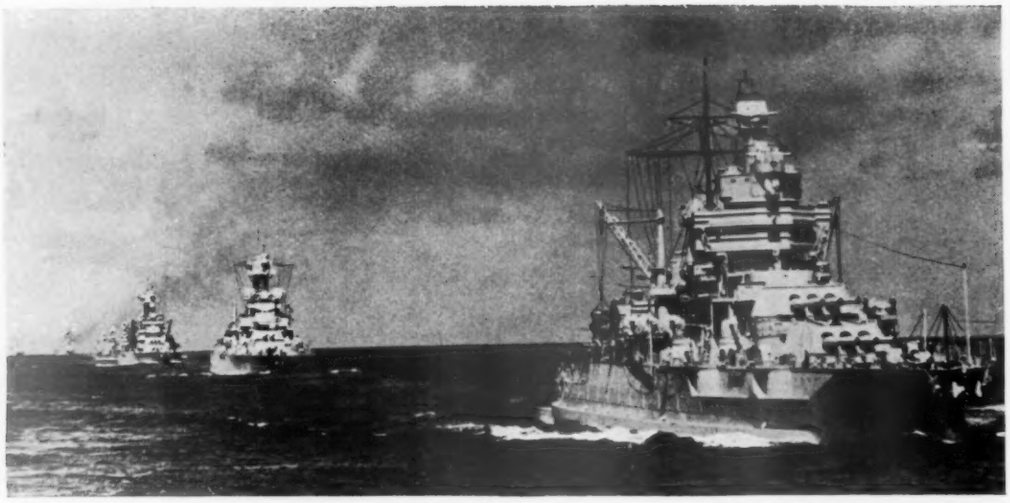


Photo: Office of War Information

Take a Good Look at these BATTLESHIPS

For if you are a motorist with tires that are getting bald, they have a particular significance to you. Each one of these gigantic fighting machines, in its construction, requires sufficient rubber to make 17,000 automobile tires, and that would keep many a motorist in tires for a good long time.

These ships, along with airplanes, tanks and numerous other fighting units required at the front, all need enormous amounts of rubber.

Not one citizen will object to every pound of rubber used to construct any of these units. They gladly are giving up their rubber and doing away with many conveniences to save this important raw material for use by Uncle Sam.

Quaker is playing an important part in supplying our Government with the vital rubber products to keep these mighty battleships in A-1 fighting condition.

Orders for rubber articles coming from any division of the Government and Defense Plants have the right of way. You would not want it otherwise.

May we ask that you be patient if your order with us seems a trifle long in reaching you? We are doing everything possible to spread what permissible civilian Industrial Rubber Products we can manufacture equitably among our many customers.

Use all your rubber products carefully. Take care of what you already have. When its usefulness is over turn it in as scrap. No piece of rubber is too small. See that your proper rubber collecting station gets all your scrap promptly.

KEEP ON BUYING *MORE WAR BONDS*

INDUSTRIAL RUBBER PRODUCTS

Rubber is scarce. There is no question about that. But rubber is not extinct for use in many civilian plants. It is not patriotic to allow your plant to lose production for want of Industrial Rubber Products.

Many plants are recognized as vitally important for which the Government will permit the use of rubber products.

Consult Quaker whenever Industrial Rubber Products should be used. Our experience of manufacturing and knowledge of current regulations are at your service.

Blast the Japs out of the Rubber Pile!

QUAKER RUBBER CORPORATION

OVER 58 YEARS CONSISTENT QUALITY

PHILADELPHIA · ***NEW YORK*** · ***CHICAGO*** · ***HOUSTON***

Western Territory

QUAKER PACIFIC RUBBER COMPANY · SAN FRANCISCO · LOS ANGELES

REG. U. S. PAT. OFF.

CP Sinkers Can take it—

JUST GIVE THEM ORDINARY CARE

FEW hand-held drills are as well designed, as ruggedly built as CP Sinker Drills. You don't have to handle them with kid gloves or baby them on the job. But, you do have to give them reasonable care, and a few simple suggestions — like the four illustrated on this page — will help you to get maximum service from your CP-32, CP-42 and CP-10 Sinker Drills. Additional suggestions for the better maintenance of CP Sinker Drills will appear in future advertisements. Watch for them.

HOW TO GET MAXIMUM SERVICE FROM YOUR CP SINKER DRILLS

1 Remove, clean air inlet screen every two weeks —more frequently if hose is old. Drill will lose power, if the air inlet screen becomes clogged.

2 Fill reservoir with good grade of oil of proper viscosity for weather conditions. If machine is used constantly, fill the reservoir every hour.

3 Before putting sinker drill in service, always connect the air hose and make sure oil is coming through the machine and out of the exhaust.

4 Blow air hose, connect to machine, turn on air and examine drill shank to see whether oil is going through working parts of the machine.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
(Hicycle...Universal)
ROCK DRILLS

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

Make Those Minus Half Inch Sizes... WITH SHORT HEAD CONES..

The Symons Short Head Cone Crusher was developed to provide increased output of extremely fine products — ***minus half inch and finer.*** Installations in stone, gravel and slag plants prove that this crusher not only produces finer sizes in greater tonnage but at a cost much lower than is possible with any other type of crushing equipment. Fine crushing problems are forgotten with the installation of a Symons Short Head Cone.

NORDBERG MFG. CO.
MILWAUKEE WISCONSIN
NEW YORK · LOS ANGELES · LONDON · TORONTO

NORDBERG MACHINERY

SYMONS CONE CRUSHERS

This simple test shows how the Concave Side

Cuts Belt *and* Power Costs!

Have someone bend a V-belt exactly as it bends in going around its pulley. As it bends, grip its sides with your fingers. You will *feel* those sides *change shape.* If the sides were straight before bending, they become *convex* as the belt bends. (See Figure 1 on the right.) Note how the sides *bulge out.*

Now try the same test with a belt which has the patented Concave side. You will feel the *same shape change*—but what a *different result!* The sides do not become *convex.* They become perfectly straight. The bent belt has a shape that exactly fits its sheave groove—as shown in Figure 2.

Two savings result. FIRST:—There is no side-bulge and this means uniform sidewall wear—*longer life!* SECOND:—There is a full side-width grip on the pulley and this carries heavier loads without slippage—saving the belts and also saving your *power!*

Only belts built by Gates are built with the Concave side, which is a Gates patent.

What Happens When a V-Belt Bends

FIG. 1

FIG. 2

434

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

CHICAGO, ILL. 549 West Washington
NEW YORK CITY 215-219 Fourth Avenue
ATLANTA, GA. 738 C. & S. National Bank Building
LOS ANGELES, CAL. 2240 East Washington Boulevard
DENVER, COLO. 999 South Broadway
DALLAS, TEXAS 2213 Griffin Street
PORTLAND, ORE. 333 N. W. 5th Avenue
SAN FRANCISCO, CAL. 1090 Bryant Street

4 WAYS to get more service from WIRE ROPE

Yes, wire rope is tough. It can stand up to the most rigorous service—and ask for more.

But that's no reason to abuse it. With a little care, by applying a few simple rules, you can get a tremendous amount of extra service from your rope.

1 Break it in with light loads

For example, when breaking in a new rope, don't slam on full power and speed right off the bat. Begin with fairly light loads. Operate at moderate speed. Give the strands of the rope a chance to seat down snugly and uniformly upon the core, so that each strand is carrying its fair share of the load. This way, the rope will assume its proper "constructional stretch" without damage, and you'll be assured of better spooling and easier handling throughout the entire life of the rope.

2 Treat it with consideration

After the rope is broken in, you can safely use whatever speeds and loads it was designed for. But don't be unnecessarily rough, even then. A smooth, gradual application of power is just as efficient as slamming into the load with a jerk. The same is true of braking. It's the heavy jerks and surge loads that beat the guts out of a piece of rope. Nine times out of ten these can be avoided without losing time.

3 Know your rope

For example, if you're using a flexible 8-strand rope for high-speed work, don't overload it. This rope is built to withstand bending fatigue and fast operation—not for heavy hogging lifts. The opposite is true of heavy-duty 6-strand rope. Lift with it—but don't try to break speed records.

4 Right maintenance means plus service

Don't neglect the few simple maintenance precautions which require so little time yet return so much in extra service. Keep your rope properly lubricated. Don't operate it over sheaves that are abraded, damaged, or out of line. Fasten clips in the approved manner. Cut off a short length from the drum end of your rope from time to time so that "grief spots" are relocated over sheaves and drums.

Wire rope is now a war weapon. Its proper use is a service to your country and to yourself. If you want good, dependable rope, and friendly service, get in touch with the Bethlehem Wire Rope distributor in your territory. He's always ready and willing to serve you.

Bethlehem Manufactures Wire Rope for all Purposes

SECO *Screens Perform Right*
ON SKF BEARINGS

● *Built by*
Screen Equipment Co., Inc.

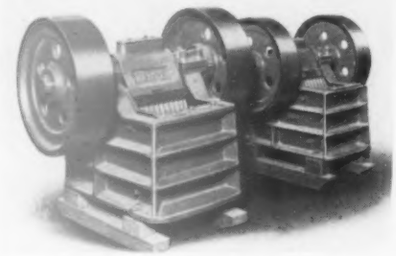
Don't think for a moment that SKF Bearings have it easy when this Seco Screen goes into action. Every time this screen shudders, they meet shocks with high load carrying capacity . . . allow for shaft deflections, distortions or weave without binding . . . and well-designed housings guard them against interference from lubricant leakage and dirt or water intrusion. All day long . . . all year long . . . they take it—and LIKE it. 5290

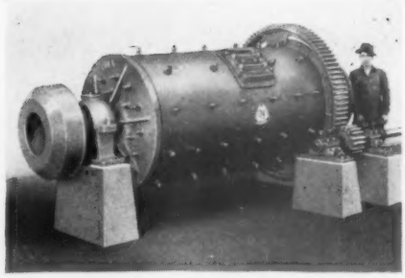
SKF INDUSTRIES, INC., PHILA., PA.

FOR "24 HOUR" PRODUCTION—USE DECO PRODUCTS

Denver Jaw Crushers

Denver Jaw Crushers are well adapted to coarse and fine crushing due to the forced feed principle. Built in bronze or anti-friction bearing types in a wide range of sizes. Ask for Bulletin No. C12-B and No. C12-B1 on Denver Jaw Crushers.



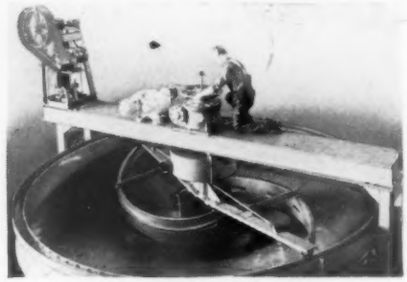


Denver Ball-Rod Mills

Denver Grinding Mills are supplied in ball, rod or tube mill lengths. Mills have steel heads, rolled steel shells and large trunnion bearings. Made in 30", 3', 4', 5' and 6' diameters. Complete information is given in Bulletin No. B1-B and B2-B.

Denver Hydroclassifiers

Denver Hydroclassifiers solve difficult fine sizing and desliming problems. Enclosed lifting mechanism and spiral rakes are distinctive advantages. Bulletin No. C4A-B gives details on Denver Hydroclassifiers. Rotary and rake classifiers also available.



Denver Thickeners

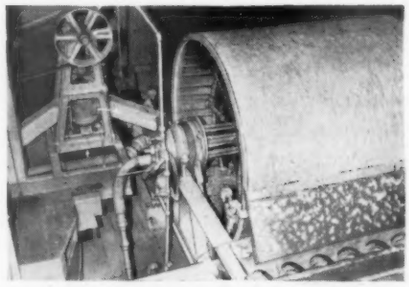
Denver Thickeners are built in the low-head beam type in sizes up to 80' in diameter. Patented spiral rakes move material to center in one revolution. Write for Bulletin 3628. For data on Adjustable Stroke Diaphragm Pumps—Bulletin P8-B.

Denver "Sub-A" Flotation

Denver "Sub-A" Flotation Cells are standard the world over for treating metallics, non-metallics and separating other materials. For complete information obtain Bulletin No. F11-B. Ask about the new Denver Portable Wet Reagent Feeder.

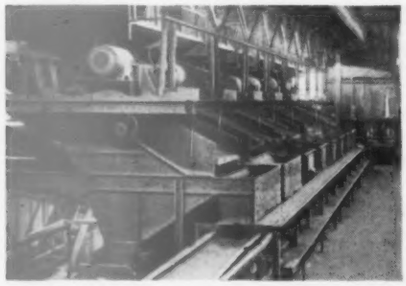
Denver Rotary Filters

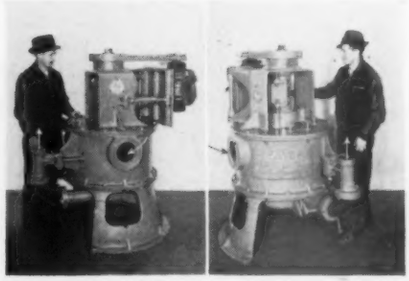
Denver Rotary Filters handle finely ground materials with efficient washing and drying of cake. Metal construction eliminates warping. Built in 3', 4' and 6' diameters. Bulletin F8-B gives data on Rotary filters. Denver Disc Filters are made in 4' size.



Dillon Vibrating Screens

The Denver-Dillon Vibrating Screen embodies a basically different principle in the application of circle throw motion. Maintenance and power costs are low. You will be interested in Denver-Dillon Vibrating Screens—Bulletin No. S3-B3.



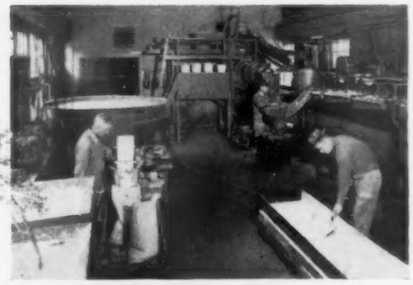


Denver Vertical Pumps

Denver Vertical Sand Pumps are made in a number of sizes. Pulp flows into bowl by gravity and is then drawn into pump chamber by vortex action. Easily handles frothy material and concentrates. See Bulletin P10-B on Denver Vertical Pumps.

Ore Testing Laboratory

The illustration below is typical of a continuous test problem being solved by the Ore Testing Division. Materials from all parts of the world are tested in our continuous and batch laboratories. Ask for Bulletin T4-B3 and Bulletin No. 3713.



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Building War Birds Nests on Time!

CARL E. NELSON, Logan, Utah delivers over 100,000 TONS of Blacktop for the War Effort in less than Six Months!

WITH the enemy battering at the door, the whole nation is watching output. High averages are the index to production for Victory. Ninety to one hundred tons an hour average for blacktop production means nests for war birds in a hurry, and it's the best possible evidence of the trouble-free service that Cedarapids Asphalt plants give. That's the daily average of Carl E. Nelson of Logan, Utah with one Cedarapids Asphalt plant on four jobs and in spite of three moves, from widely divergent points.

Iowa Cedarapids plants are simple in design. They are compact, easily moved — even to the great Model E plant, the largest fully portable plant built today — they get on the job and are producing in a hurry! When you buy a Cedarapids, you are buying an *asphalt factory* engineered to your particular problem from proved units and tested by some of the leading producers of the country.

Wartime performance can teach much for peacetime operation. The advantages that Cedarapids equipment brings for getting the war jobs done will help you meet competition after the "duration."

It's time to learn about Cedarapids equipment!

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

IOWA MANUFACTURING CO. **Cedarapids** Built by IOWA **Cedar Rapids, Ia.**

A $10 Word *that gets down to Brass Tacks*

No, synergism is not a new word. It is an old word, with the basic meaning—"forces working together to produce a whole greater than the sum of the parts." Lately it has developed an industrial connotation of "minds stimulating each other to create more than the sum total of the ideas expressed."

SYNERGISTIC thinking is the next step beyond co-operation—the creative step that evolves better methods, more effective processes, new materials, faster production, finer products. It has worked miracles in war production.

But synergism is not confined to huge achievement. On the contrary, synergistic thinking is responsible for the little creations that pave the way for bigger accomplishment. Wherever you find minds stimulating each other to action, there you will find progressive steps—big or little.

Sometimes it takes the form of a crude, but functioning apparatus—a rough sketch—an immature product. It is as likely to be the brain-child of skilled workmen as of Ph.D's. Perhaps it developed from a discussion across a desk or around a machine. But always it represents the impact of minds "clicking" together for a practical creative result.

Industry—from top to bottom—is learning that synergism speeds progress, raises standards. The war is a good teacher. Here at Atlas, we have practiced synergism in our spheres of chemical production to gain some notable results in collaboration with our customers. We would like to show you what synergistic thinking may accomplish for any problems of yours that may lie within our scope.

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY
WILMINGTON, DELAWARE
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Industrial Explosives • Industrial Finishes • Coated Fabrics • Acids
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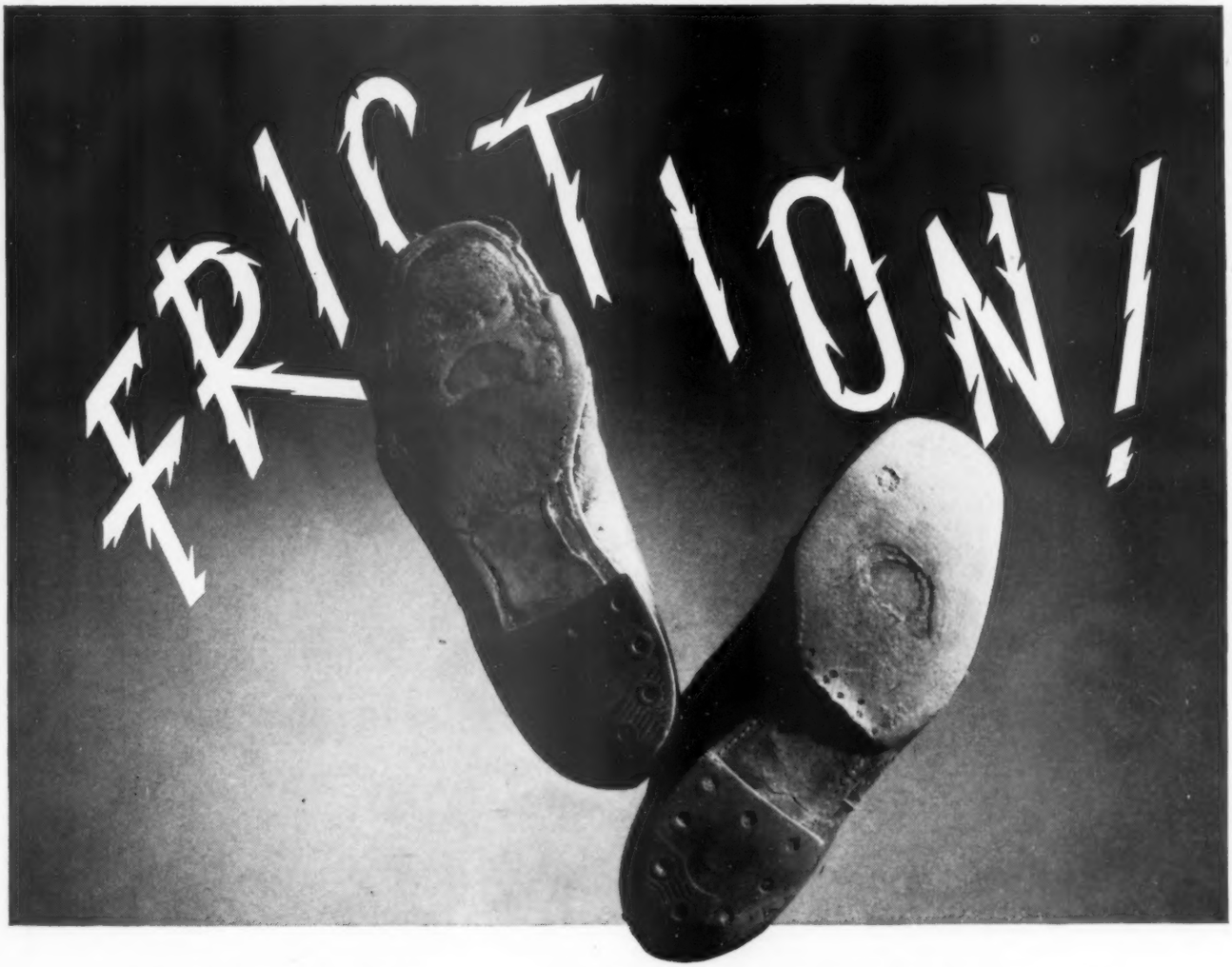

REDUCE WEAR AND REMOVE CARBON WITH MACMILLAN RING-FREE MOTOR OIL

Undue motor wear, waste of fuel and excessive carbon have no place in a sound preventive maintenance program. At the same time, "production" must be speeded up. That's why operators simply must pay more than usual attention to motor lubrication . . . and motor *cleanliness.*

Macmillan RING-FREE Motor Oil cuts down waste and wear while speeding up performance, and at the same time, RING-FREE removes carbon!

In 1094 Certified Road Tests, with various makes of owner-driven cars, 10 per cent increases in gasoline mileage were not uncommon after crankcases were drained and refilled with RING-FREE. As indicated by these tests, the average immediate saving was 1.3 miles per gallon! These tests emphasize that RING-FREE lubricates better . . . *reduces friction faster.* It delivers direct to the drive shaft more of the horsepower ordinarily wasted in overcoming motor friction. It postpones "down-time" for repairs.

Macmillan RING-FREE Motor Oil combines all these qualities: great film strength, high heat resistance, long cling to metal, fast penetration . . . *plus* the fact that it is non-corrosive, is less affected by dilution and it *removes carbon.*

CARBON REMOVAL A NATURAL RING-FREE FUNCTION

Macmillan RING-FREE Motor Oil actually removes carbon while the motor runs! Hence, by its continued use, pistons, rings, valves—all vital parts—stay cleaner. Carbon removal is a natural function of RING-FREE, inherent in the crude oil and retained by the exclusive Macmillan patented refining process, *without the use of additives.*

TO SUM UP: MACMILLAN RING-FREE gives more horsepower to the drive shaft—tangible saving of fuel—allows less wear on hard-to-replace engine parts—it removes carbon.

Macmillan Petroleum Corporation

50 W. 50th St., New York • 624 S. Michigan Ave., Chicago • 530 W. Sixth St., Los Angeles

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Macmillan Petroleum Corp.

MACMILLAN RING-FREE MOTOR OIL

REDUCES WEAR BY REDUCING FRICTION

The Pit-and-Quarry Industries Are Facing Their Biggest Job!

Cement, crushed stone, sand and gravel . . . the basic materials of construction . . . are widely available, reasonably plentiful, not subject to priorities. These ingredients of concrete keep the war construction program rolling on schedule. Besides their normal uses in building roads, factories, houses, dams, etc., they are being called upon to save iron and steel in countless ways. Ships, storage tanks, fences, bath-tubs, manhole covers . . . even sash weights . . . are to-day being manufactured of concrete to save precious iron and steel for war purposes.

Plants producing cement, crushed stone, sand and gravel are busy night and day turning out their prosaic, but vitally important products. They are using, wearing out, constantly in the market for tremendous quantities of machinery, equipment and supplies.

Reach this super-active market through PIT AND QUARRY, *first* in this field by any yardstick . . . in circulation, in advertising volume, in reader preference. Write for a rate card to-day. Ask for a free market survey covering your products.

PIT AND QUARRY

HERE'S THE WAY THEY DO IT IN OLD KENTUCKY

One of the Cleveland DR30 machines as set up at the 18-foot x 40-foot face.

THIS limestone producing property in central Kentucky had a problem. The overburden was too heavy for economical removal. So they opened up underground operations by sinking a shaft 7 x 22 feet in size to a depth of 265 feet. The mine is worked by the room-and-pillar method, Cleveland DR30 Wagon Drills being used, two in a heading, the face being 18 feet high x 40 feet wide. Sixteen holes are drilled by each machine, as per the round shown in drawings below.

They gained these advantages by wagon drill operation:

Much quicker and easier to set up, as compared with using tripods.

Six-foot steel changes can be used as against 3-foot changes with the ordinary guide shell.

Much easier labor on the drill operators.

The 18-foot ceiling is drilled without benching.*

There is very little secondary drilling, and the ultimate yield is expected to be about 3 tons of stone for a pound of explosive.

** Similar holes are being drilled in other properties to depths of as much as 30 feet.*

Let our engineers help you in working out profitable drilling methods in your quarry or mining property. Bulletin 132 gives full information on Cleveland Wagon Drills. Bulletin 122 covers Hand Sinkers. Did you receive your FREE copy of our Driller's Handbook?

THE CLEVELAND ROCK DRILL CO.

Subsidiary of The Cleveland Pneumatic Tool Co.
CLEVELAND, OHIO

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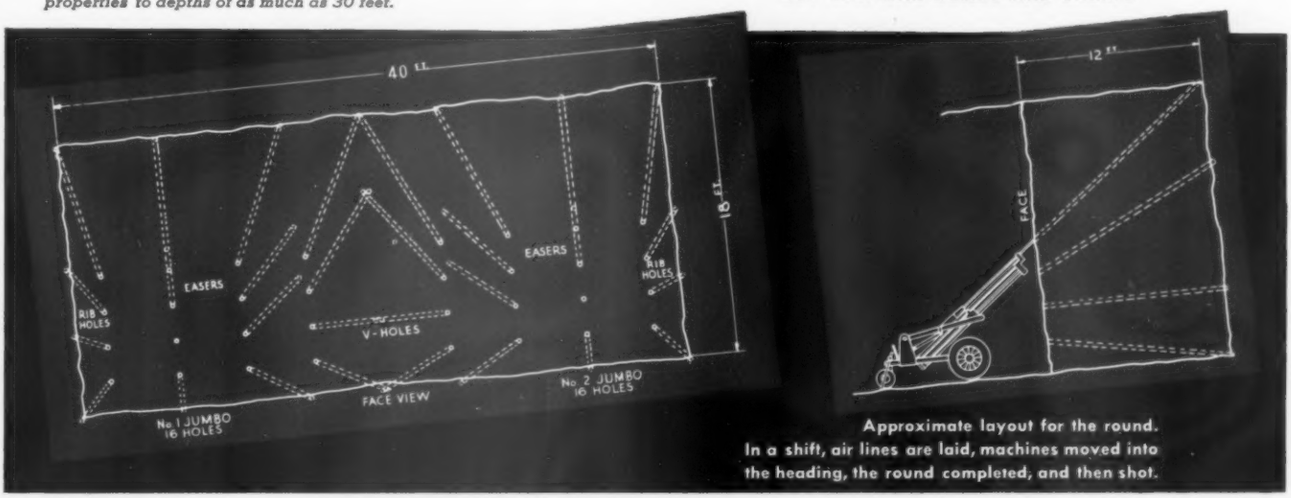
BUY U. S. WAR BONDS AND STAMPS



Approximate layout for the round. In a shift, air lines are laid, machines moved into the heading, the round completed, and then shot.

★ **When we tell you that one truck can do the work of 3 to 6 of your present trucks . . . we mean just that.**

There are dozens of rock quarries, lime, cement, sand and gravel plants that could eliminate most of their investment, operating and maintenance expense of trucks, and, in addition, save manpower, by modernizing their haulage system with the Dempster-Dumpster.

The Dempster-Dumpster system of material handling will serve either of two purposes for you now. First: if you need more production, install Dempster-Dumpster Hoisting Units on your present trucks, and with a sufficient number of detachable bodies to suit your requirements, you can quadruple your production. Second: if your production is now sufficient, eliminate three-fourths of your present trucks, install Dempster-Dumpster Hoisting Units on the remaining ones and, with detachable bodies to meet your requirements, you will equal your present production schedule, at amazing savings in costs, time and manpower.

Regardless of whether your material is light, heavy, fine or coarse, there's a Dempster-Dumpster built to handle it. And when you get a Dempster-Dumpster, you've got something worth while!

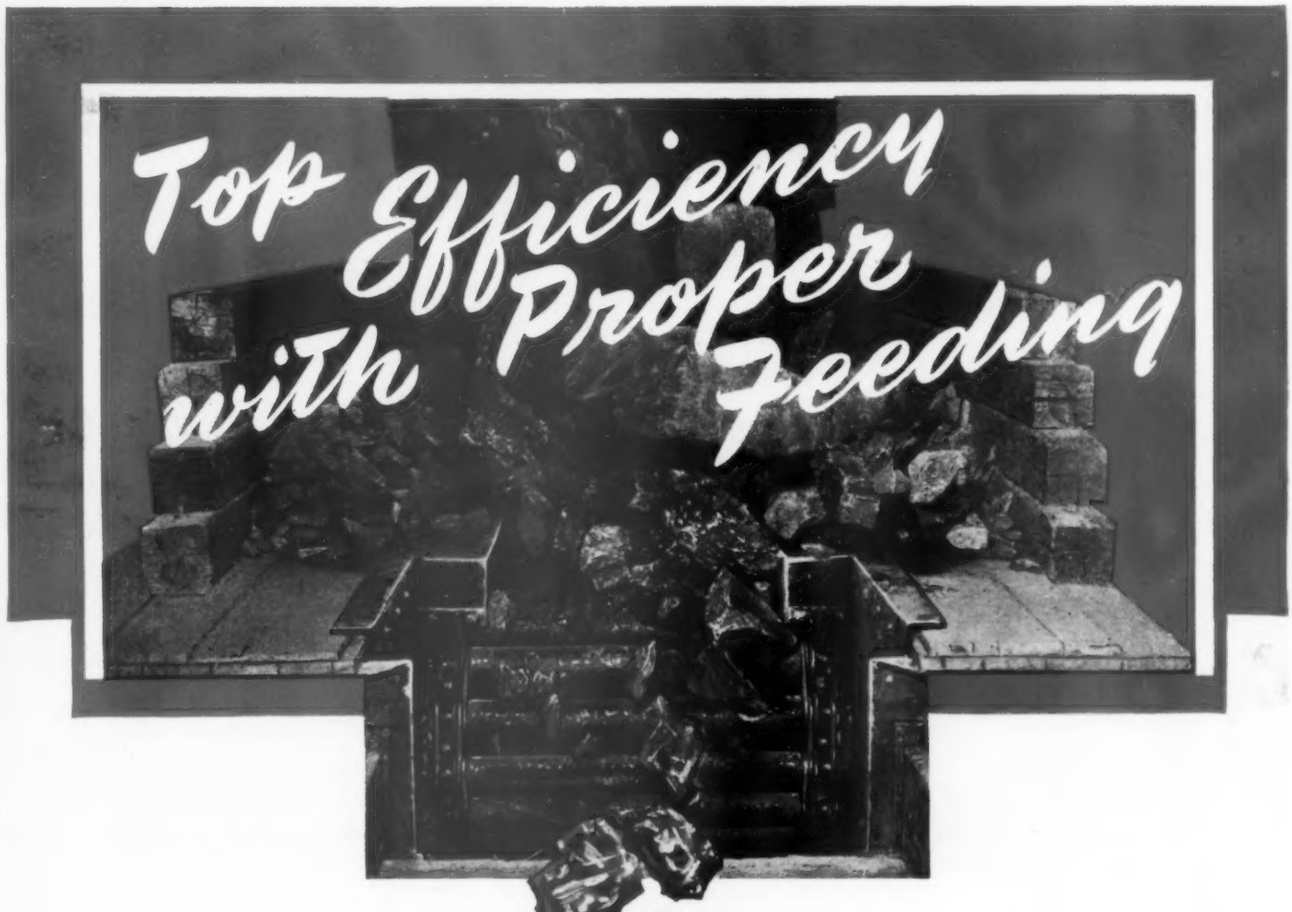
Although reasonably prompt deliveries may be made, we suggest that you investigate the Dempster-Dumpster system of material handling at once, even though you may not contemplate using it now.

Write for completely illustrated manual showing dozens of different types of material handling problems that have been met with the Dempster-Dumpster System. Our engineers will be glad to cooperate with you. Dempster Brothers Inc., 153 Springdale Addn., Knoxville, Tennessee.

DEMPSTER DUMPSTER

There is a Dempster-Dumpster Built For Every Material Handling Job

Top Efficiency with Proper Feeding



The first step in plant effieiency depends on the feeding of the rock or ore to the primary crusher. Different materials and conditions require different types of feeders. Pioneer builds four types.

The Pioneer Oro Manganese Feeder is an extra heavy duty feeder for handling heavy ores or large abrasive rocks.

The Pioneer Traveling Grizzly Feeder is a heavy duty feeder which by-passes the small materials around the crusher.

The Pioneer Apron Type Feeder is a solid pan feeder, suitable for feeding all types of rock, ore or gravel.

The Mechanical Plate Type Feeder is an eccentric feeder and recommended for feeding gravel onto a belt conveyor.

There is a Pioneer Feeder for every feeding requirement. Ask for recommendations to answer your feeding problem.

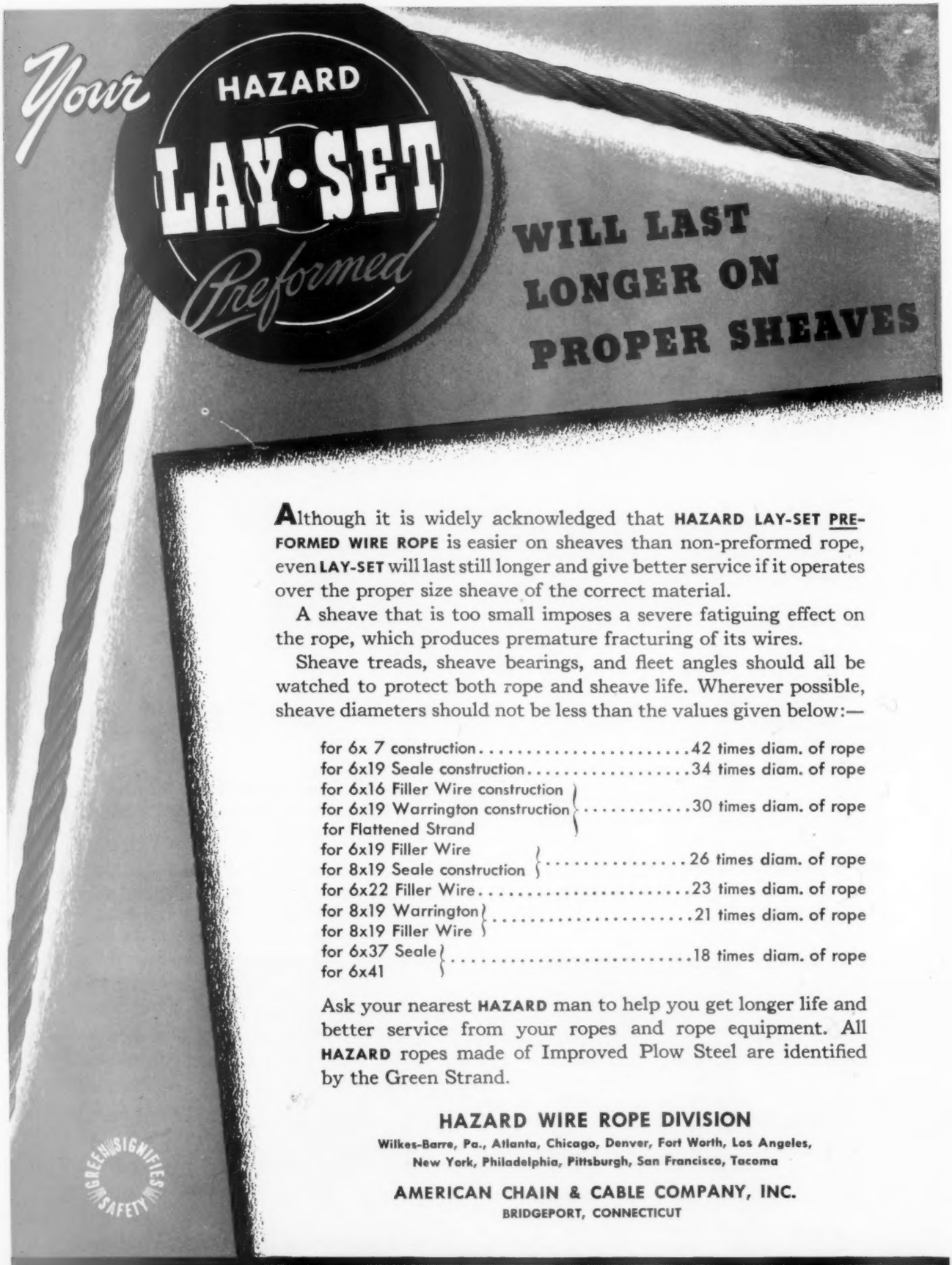
TWO PIONEER APRON TYPE FEEDERS HANDLING IRON ORE ON THE MESABI RANGE.

PIONEER TRAVELING GRIZZLY FEEDER HANDLING INDIANA LIMESTONE.

Pioneer

ENGINEERING WORKS

MINNEAPOLIS, MINNESOTA, U. S. A.



Although it is widely acknowledged that **HAZARD LAY-SET PREFORMED WIRE ROPE** is easier on sheaves than non-preformed rope, even **LAY-SET** will last still longer and give better service if it operates over the proper size sheave of the correct material.

A sheave that is too small imposes a severe fatiguing effect on the rope, which produces premature fracturing of its wires.

Sheave treads, sheave bearings, and fleet angles should all be watched to protect both rope and sheave life. Wherever possible, sheave diameters should not be less than the values given below:—

for 6x 7 construction	42 times diam. of rope
for 6x19 Seale construction	34 times diam. of rope
for 6x16 Filler Wire construction for 6x19 Warrington construction for Flattened Strand	30 times diam. of rope
for 6x19 Filler Wire for 8x19 Seale construction	26 times diam. of rope
for 6x22 Filler Wire	23 times diam. of rope
for 8x19 Warrington for 8x19 Filler Wire	21 times diam. of rope
for 6x37 Seale for 6x41	18 times diam. of rope

Ask your nearest **HAZARD** man to help you get longer life and better service from your ropes and rope equipment. All **HAZARD** ropes made of Improved Plow Steel are identified by the Green Strand.

HAZARD WIRE ROPE DIVISION

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AMERICAN CHAIN & CABLE COMPANY, INC.

BRIDGEPORT, CONNECTICUT

GREEN SIGNIFIES IN SAFETY

HAZARD LAY·SET *Preformed* WIRE ROPE

CEMENT MIXER SINGIN'

Boss happy, too, because
Bemis RIP-CORD Closure
Saves so much time on the job . . .

The cement worker's melody may be a little off key, but it comes from the heart. For the cement he is using comes in cotton bags closed with Bemis Rip-Cord Closure.

The Rip-Cord Closure can be opened easily without removing gloves . . . without tools . . . without tediously picking at wire or cord ties . . . without damaging the bag. Just a quick jerk on the rip cord and the bag is ready to empty.

Rip-Cord closing is efficient on your production line . . . brings economies on new bags . . . conserves storage space . . . increases the life of multi-trip bags as much as 50%.

Why not look into the possibilities of Rip-Cord economy and sales appeal for your product!

ASK THE MAN WHO OPENS THE BAG

If you want proof of the sales appeal and efficiency of the Rip-Cord Closure, ask the man who opens the bag. He'll tell you how a quick jerk opens the closure without damaging the fabric of the bag. This saves time and trouble . . . increases bag salvage. Rip-Cord closing may be used on any type of cloth cement bag.

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Bemis Bro. Bag Co., 413 Poplar Street, St. Louis, Missouri

Please send complete details on efficient Bemis Rip-Cord Closures.

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Company _____

Street _____

City _____ *State* _____

LAST YEAR'S BONDS GOT US STARTED

THIS YEAR'S BONDS ARE TO WIN!

★ Last year saw nearly 30,000,000 workers voluntarily buying War Bonds through some 175,000 Pay-Roll Savings Plans. And buying these War Bonds at an average rate of practically 10% of their gross pay!

This year we've got to top *all* these figures—and top them handsomely! For the swiftly accelerated purchase of War Bonds is one of the greatest services we can render to our country . . . and to our own sons . . . and our neighbors' sons. Through the mounting purchase of War Bonds we forge a more potent weapon of victory, and build stronger bulwarks for the preservation of the American way of life.

"But there's a Pay-Roll Savings Plan already running in my plant."

Sure, there is—but how long is it since *you've* done anything about it? These plans won't run without winding, any more than your watch! Check up on it today. If it doesn't show substantially more than 10% of your plant's pay-roll going into War Bonds, it needs winding!

And you're the man to wind it! Organize a vigorous drive. In just 6 days, a large airplane manufacturer increased his plant's showing from 35% of employees and 2½% of pay-roll, to 98% of employees and 12% of pay-roll. A large West Coast shipyard keeps participation jacked up to 14% of pay-roll! You can do as well, or better.

By so doing, you help your nation, you help your workers, and you also help yourself. In plant after plant, the successful working out of a Pay-Roll Savings Plan has given labor and management a common interest and a common goal. Company spirit soars. Minor misunderstandings and disputes head downward, and production swings up.

War Bonds will help us win the war, and help close the inflationary gap. And they won't stop working when victory comes! On the contrary—they will furnish a reservoir of purchasing power to help American business re-establish itself in the markets of peace. *Remember, the bond charts of today are the sales curves of tomorrow!*

You've done your bit Now do your best!

THIS SPACE IS A CONTRIBUTION TO AMERICA'S ALL-OUT WAR EFFORT BY

PIT & QUARRY

Over that Horizon comes *Freedom*

PAUSE, Norseman, and look to the western horizon. For twenty centuries the Vikings roved beyond it. Today, hundreds of your brothers have escaped across this horizon, and will return with their allies to win back your Nazi-cursed soil.

You toil by day beneath the lash of your oppressors. But, by night, you strike back again and again—for your love of freedom is unconquerable.

As you do your part, so do we. The mine and quarry men of America are applying their effort and skill toward freedom for the world. The millions of tons of rock and coal and ore that they blast loose are the very genesis of war machines and munitions. To speed their work and safeguard their lives, the Ensign-Bickford Company is producing Safety Fuse, Primacord-Bickford Detonating Fuse, and other supplies essential to Victory—for *Victory Begins Underground!*

THE ENSIGN-BICKFORD CO.
SIMSBURY, CONNECTICUT

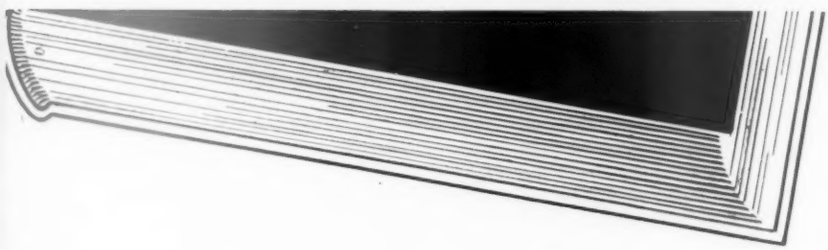
E-P

Primacord-Bickford
Detonating Fuse

An Indispensable Tool For Both Operator and Supplier of Equipment

The pit-and-quarry industries, in providing important basic raw materials, bear a large responsibility for the success of America's war effort. For the operator, the revised Technical Section of the 1943 Handbook provides a ready answer for many of his operating problems. For the concern supplying him with the tools and machinery necessary to produce his materials, the 1943 Directory Section supplies an accurate, up-to-the-minute list of all known producers of nonmetallic minerals and their products. Each new listing has been carefully checked for accuracy. Previous listings have been revised and brought up to date. Inactive firms have been eliminated.

1943 Edition Just Published



Directory Section listings appear two ways—(1) alphabetical by companies, (2) geographical by plants. You get company names, officers, location of plants, size or capacity, and the names of the men who do the buying. Choose the complete Handbook and Directory . . . or the convenient, flexibly-bound Directory alone. Order NOW and get one of the first copies off the presses. Use the handy coupon below.

- 820 PAGES
- 28 CHAPTERS
- 15,000-NAME DIRECTORY
- COMPLETELY INDEXED
- AUTHORITATIVE

Pit and Quarry,
538 S. Clark St., Chicago, Ill.

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Please send.....copies of the 1943 DIRECTORY ($10.00 per copy)

☐ Check enclosed.....

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160 Foot Dorr Hydroseparator In Earthen Tank For Phosphate Washing Plant

THE 160 foot Dorr Hydroseparator shown above is the largest ever to be installed in an earthen tank. It will handle 35,000 gallons per minute of water and 650 long tons per hour of feed—producing 450 long tons per hour of recoverable phosphate sands.

Dorr Torq Hydroseparators and Thickeners are inherently correct for use in dollar-saving earthen tanks. The exclusive "torq" feature—automatically self-raising and lowering arms—reduces to a minimum the danger of stalling or breakage. Installations like this 160 foot Hydroseparator have proven the practicability of Dorr Torq mechanisms used in earthen tanks—proven too, the substantial savings possible with this type of construction.

A Dorr Torq mechanism will give you topnotch operating results—an earthen tank can probably save you money. Combined, they provide the simplest and most economical settling capacity possible. Why not check our nearest office for further information?

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PIT AND QUARRY

Vol. 35 MAY, 1943 No. 11

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MEMBER AUDIT BUREAU OF CIRCULATIONS

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SUN LUBRICANTS

stay on bearings longer . . . keep out dust . . . reduce wear"

If ever dust was an enemy of production . . . a destroyer of equipment . . . and a cause of bearing wear it certainly is true of quarry dust. Every operator knows what a problem it is to keep these sharp abrasive particles from grinding into finely finished bearing surfaces. But here's how one operator kept quarry dust out of bearings and knocked out unnecessary wear by applying the right lubricant in the right place.

In a large Pennsylvania quarry trouble was stopped in its tracks when a Sun Oil Engineer — one of those Doctors of Industry — recommended a change from a competitive lubricant to Sun No. 897 Adhesive Pressure Grease. This modern friction fighter now stays on bearings longer . . . keeps quarry dust from getting between metal surfaces and grinding bearings. In addition to the reduction of wear there has been a saving of 33% in the amount of lubricants used.

In these days your hours of useful production are invaluable . . . many of your machines are not replaceable — protect them with performance-proved methods of lubrication. Put the efficiency of your equipment in the able hands of a Sun Oil Engineer. He's ready . . . willing . . . and able to help you keep your machines on the job and producing without breakdowns or delays. Get in touch with your local Sun office . . . or write

SUN OIL COMPANY • ***Philadelphia***

Sun Oil Company, Limited, Toronto, Canada

SUN PETROLEUM PRODUCTS

SUNOCO

HELPING INDUSTRY HELP AMERICA

ROBINS
CONVEYING BELT COMPANY

changes its name!

For nearly half a century, we've borne this fine old name . . . borne it proudly . . . made it the synonym and symbol of quality not only here but in many other parts of the world. Now we lay it aside tenderly . . . not entombed but enshrined.

In its place, we adopt a new name . . . a name more truly definitive of the range of our products, the extent of our services . . . services to those who mine coal, ore, minerals, sand, gravel . . . services to those who use these elements to manufacture the implements of industry which make this country great and strong and victorious. To these people, these corporations, ROBINS has long been known and honored for its pioneering spirit . . . its daring to try the seemingly impossible in order to advance the industrial economy of the nation and the world.

During the first decade of its existence, ROBINS conceived and introduced 41 innovations in the field of materials handling methods and machinery.

In the years since then, other equally radical and constructive advancements have been initiated by ROBINS. Because they are so wide in variety, in utility and in application, we believe it advisable to adopt a name more encompassing, a name less restrictive in its connotations than Robins Conveying Belt Co.

And now — without any change in directorship, management or corporate structure, we become: ROBINS CONVEYORS INCORPORATED.

FOR MATERIAL AID
IN MATERIALS HANDLING . . . . ***It's ROBINS***

ROBINS created

- THE FIRST belt made especially for conveying materials
- THE FIRST troughed belt conveyor
- THE FIRST belt with a thick cover at the center
- THE FIRST splice made with a portable vulcanizer
- THE FIRST single-plane idler
- THE FIRST stepped-ply belt
- THE FIRST protected screw takeup
- THE FIRST self-reversing tripper
- THE FIRST belt conveyor for handling stone
- THE FIRST belt conveyor for carrying coal
- THE FIRST belt conveyor for sand and gravel
- THE FIRST conveyor storage system
- THE FIRST picking belt
- THE FIRST belt conveyor in a gas works
- THE FIRST belt conveyor that ever handled copper ore
- THE FIRST mechanical ore bedding system
- THE FIRST belt system for loading colliers
- THE FIRST conveyor for handling excavated material
- THE FIRST system of belt conveyors to handle mixed concrete
- THE FIRST tandem-driven belt conveyor
- THE FIRST tripper with a side-discharge belt
- THE FIRST conveyor belt 96 inches wide—the widest ever built
- THE FIRST conveyor on a dredge
- THE FIRST counter-weighted hoisting tower
- THE FIRST "Ward Leonard System" hoisting tower
- THE FIRST hydraulic hoisting tower
- THE FIRST power-saving idler
- THE FIRST belt-unloading system for boats
- THE FIRST travelling bridge using a belt for stocking and a bucket for reclaiming
- THE FIRST airplane-tripper
- THE FIRST belt feeder
- THE FIRST ship loading plant with tripper and loading boom
- THE FIRST conveyor in a tunnel under a storage pile
- THE FIRST rotary grizzly
- THE FIRST rotary stone grizzly
- THE FIRST training return idler
- THE FIRST positive training troughing idler
- THE FIRST circle-throw screen
- THE FIRST single-shaft circle-throw screen
- THE FIRST to use cider cloth on conveyor belting
- THE FIRST self-feeding coke wharf

ENGINEERS • MANUFACTURERS • ERECTORS

ROBINS
CONVEYORS
INCORPORATED
(ROBINS CONVEYING BELT CO.)
PASSAIC • NEW JERSEY

MATERIALS HANDLING MACHINERY

PIT AND QUARRY

CHICAGO MAY, 1943

Producers of Lime and Stone Discuss Prices With OPA

A representative group of agricultural liming materials producers, dealers, and trade association men met in Washington, March 22, with officials of the Office of Price Administration to discuss a forthcoming regulation establishing nationwide maximum prices for both producers and retailers of those products.

All phases of production costs, bagging methods of sale, and delivery problems were discussed.

OPA emphasized that the meeting was designed to obtain the views of the industry and that no final decision was reached on ceiling prices or details of the pending regulation which probably would be issued shortly. Full consideration of the recommendations received from attending representatives of the industry is being given by OPA.

The Agricultural Adjustment Agency, largest United States buyer of agricultural liming materials, was represented by Don Aitken. The session was opened by C. G. Gran, head of OPA's Agricultural Chemicals Section, and discussions were conducted by Henry A. Huschke, of the Lime and Fertilizer Materials Unit of that OPA section.

Representatives of the industry present included J. R. Boyd, of the National Crushed Stone Association, Washington, D. C.; J. Feiser and W. C. Le Gore, of the Le Gore Lime Company, Le Gore, Maryland; H. D. Brigstocke, of the Thomasville Stone & Lime Company; Thomasville, Pennsylvania; W. V. Brumbaugh, of the National Lime Association, Washington, D. C.; George Mintz, of the Michigan Limestone & Chemical Company, Buffalo, New York; Richard Immel, R. E. Sansom, and Thomas McCrosty, of the American Limestone Company, Knoxville, Tennessee; Harold Kaiser, of the Solvay Sales Company, Syracuse, New York; Walter Mann, of the Reliance Lime & Fertilizer Company, Norfolk, Virginia; S. Y. Priddy, of Charles W. Priddy Company, Norfolk, Virginia; E. J. Krause, of the Columbia Quarry Company, St. Louis, Missouri; Fred K. Betts, Jr. of Harrisonburg, Virginia; W. C. Sparks, of the Cedar Bluff Quarries, Princeton, Kentucky; Philip Heim of the Carbon Limestone Company, Youngstown, Ohio; and Ralph Roop, of the Southern States Corporation, Baltimore, Maryland.

Owens-Illinois Erects California Sand Plant

A new sand plant with a capacity of 300 tons of refined glass sand per day is being erected near Lake Majella, California, by the Owens-Illinois Pacific Company.

The plant is a temporary structure to be replaced by a permanent plant after the war. Washing and screening equipment is being installed. Magnetic separators will remove the iron from the sand.

Coming Events

May 5-7, 1943 — Chicago. Annual meeting, American Road Builders' Association, Edgewater Beach Hotel.

May 10-12, 1943 — Hot Springs, Virginia. Special meeting and board meeting, National Lime Association, The Homestead.

June 3-4, 1943 — Chicago. Eighth annual meeting, National Industrial Sand Association, Palmer House.

Grand Rapids Gravel Loses Test Case on Owner-Driver Status

Truck owner-operators who transported sand, gravel and ready-mixed concrete for the Grand Rapids Gravel Company in the period from 1936 to 1940 were "employees" under the terms of the Social Security Act, as distinguished from contractors, Judge Fred M. Raymond ruled March 30 in Federal Court at Grand Rapids in dismissing the complaint of the gravel company for recovery of $3,000 in social-security taxes and interest.

The taxes were legally assessed and collected, Judge Raymond ruled in ordering judgment entered dismissing the complaint.

In his findings of fact the court called attention to testimony of several truck owner-operators who declared that they considered themselves as employees of the plaintiff and commented on the fact that, on at least one occasion, the company had stated in court, when seeking an injunction in a labor dispute, that the owner-operators were employees of the company.

In the 1936-1940 period covered by the suit, the company paid social-security taxes on its regular employes but not on truck owner-operators. In 1941, after a ruling by the commissioner of internal revenue that owner-operators were employees under the act, the gravel company filed a supplemental and amended return and paid the taxes and interest. In August, 1941, claims for refunds were filed and rejected and the company subsequently brought the action.

Because of the wide-spread interest in the case, the National Sand & Gravel Association and National Ready Mixed Concrete Association aided the Grand Rapids firm in fighting the ruling.

Cement Demand Down in East; Higher in Southwest and West

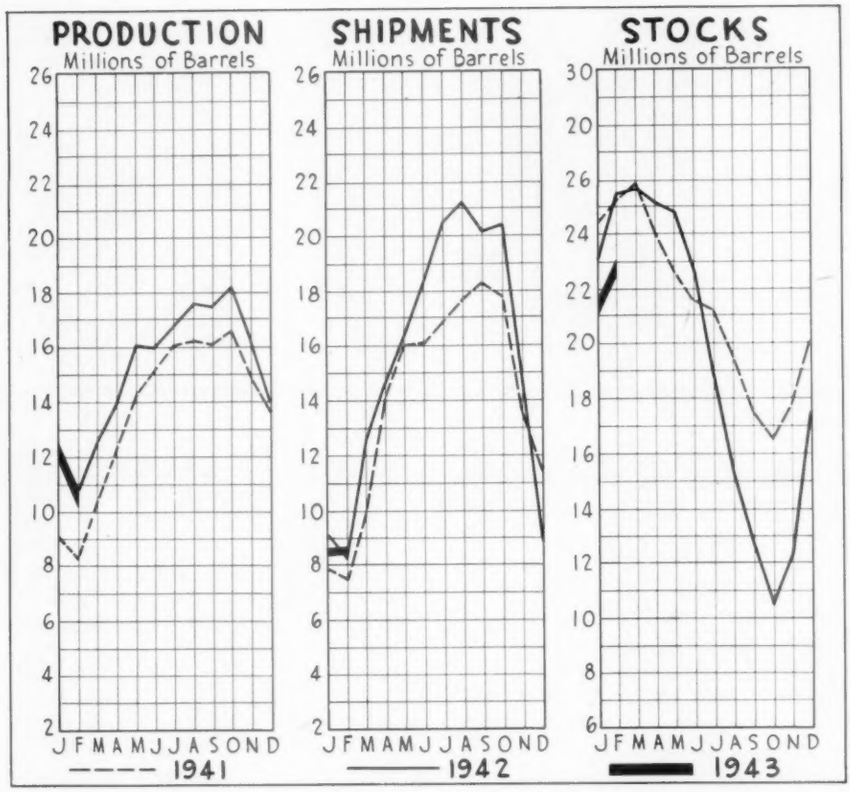
Demand for Portland cement as measured by mill shipments in February, 1943 was down by approximately one-third from February, 1942 in the New England and Middle Atlantic states. (See chart at right for production-shipments-stocks data.)

In all other sections of the country, shipments were greater than in February 1942. The largest gain occurred in the Rocky Mountain states where demand was more than doubled. Shipments from mills in the Southern states increased by one-fifth and in the Middle-western states they were also one-fifth greater than in February, 1942 despite substantial declines for Michigan and Iowa. In the Southwestern and Pacific Coast states demand during February, 1943 was somewhat higher than in the same month last year.

Stocks of finished cement were lower than usual for the end of February in varying degrees in all sections of the country except the New England and Middle Atlantic states and in Michigan. However, they were far below customary levels only in Kansas and western Missouri, Nebraska, Oklahoma and Arkansas districts. Clinker stocks on February 28, 1943 were lower in nearly all districts than at the same time last year. In the Rocky Mountain states they were considerably below usual stocks of clinker.

Revising previous procedure, the War Production Board now requires approval for essentiality by the Facilities Review Committee of all highway constuction costing more than $100,000 regardless of whether priorities assistance or the use of critical materials is involved. Projects costing less than $100,000 may be authorized by the regional directors of the War Production Board after consultation with district engineers of the Public Roads Administration.

The new procedure, effective March 17, is designed primarily to conserve manpower and construction equipment. It, however, presages a further decline in highway construction with resultant adverse effect upon the consumption of cement, crushed stone, sand and gravel.



The Portland-cement industry in February, 1943 produced 10,293,000 barrels, shipped 8,656,000 barrels, and had in stock at the end of the month 23,005,000 barrels of cement, according to the Bureau of Mines. Compared with the same month a year ago, production declined 5 per cent., shipments rose 4 per cent. and stocks were 10 per cent. lower.

Paid Circulation of Pit & Quarry Among Nonmetallic - Mineral Producers in Recent Years:

1942	(November)	6,650
1942	(May)	6,513
1941	(November	6,179
	(May)	5,945
1940	(November)	5,397
	(May)	5,037
1939	(November)	4,641
	(May)	4,617
1938	(November)	4,496
	(May)	4,366
1937	(November)	3,971
	(May)	3,772
1936	(November)	3,654

CONTINUOUSLY FOR 26 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

82% increase in 6 Years

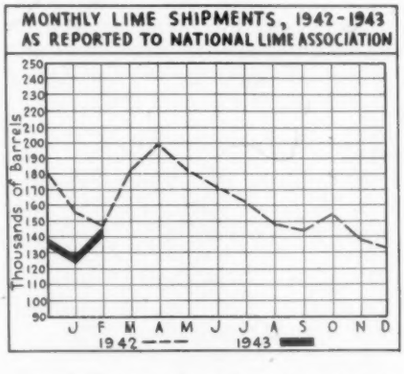
Liberty Limestone Has $50,000 Fire Loss

Fire damage estimated at around $50,000 was done to two crushers at the Sherwood quarry of the Liberty Limestone Corporation near Buchanan, Virginia, on March 31. It was reported the blaze started in the quarry repair shop.

McCrady-Rodgers Buys 7-Story Building

The McCrady-Rodgers Company, Pittsburgh producer of sand, gravel and ready-mixed concrete, plans to move about May 1 into new headquarters at Third Avenue and Ross Street where it has purchased a 7-story building.

The building will be re-named the McCrady-Rodgers Building and the company will occupy the fifth and sixth floors.


MONTHLY LIME SHIPMENTS, 1942-1943
AS REPORTED TO NATIONAL LIME ASSOCIATION
Thousands of Barrels
J F M A M J J A S O N D
1942
1943

According to data collected by the National Lime Association, 64 companies in February, 1943, shipped 146,689 tons of lime (108,922 quicklime; 37,767 hydrate). Reporting companies represent 42.7 per cent. of the association's total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 415,000 tons. Shipments of lime by users for February, 1943, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	1,302	6,476
Building	8,867	11,073
Chemical	98,753	20,218
Total	108,922	37,767

Two Cement Plants, Idle 22 Years, to Give Up Equipment

A modification decree to allow conversion to war use of the equipment of the long-closed Ideal Cement Company plant at Concrete, Colorado, was signed in Denver by Federal District Judge J. Arthur Symes recently. According to the decree, some of the machinery will be junked and sold for scrap but much of the equipment is to be repaired and used in other plants.

The order also includes the Ideal plant at Hanover, Montana. The Concrete and Hanover plants were shut down by an anti-trust decision in 1921 in proceedings charging restraint of trade and have been idle since. The properties were ordered sold but no buyers could be found.

Modification of the 1921 decree was sought because of the plants' potential usefulness in the war effort. The equipment will be allocated by the War Production Board to cement plants showing need for it.

Move Oklahoma Plant to Far-Off Alaska

Equipment at a quarry and crushed-stone plant which has been operated by the Kaser Construction Company near Cleveland, Oklahoma, to supply materials for an air-base project is being moved to Alaska. More than 100,000 tons were produced at the Oklahoma site.

The Kaser company has a contract to complete a section of the new Alcan Highway in Alaska and many of the men who worked on the Oklahoma project will move on to Alaska.

Lawrence Portland Buys Maine Central Wharf

The Lawrence Portland Cement Company of Thomaston, Maine, has purchased the Maine Central Wharf and adjoining land.

The wharf has been used almost exclusively by the cement plant for some time in the unloading of coal and gypsum.

V. P. Ahearn Addresses Catholic Conference

V. P. Ahearn, executive secretary of the National Sand & Gravel and National Ready Mixed Concrete Associations, was one of the principal speakers at the Roman Catholic Conference on Industrial Problems held March 22 and 23 at Wheeling, West Virginia.

The conference was called by the Most Reverend John J. Swint, bishop of Wheeling and sessions took place in the auditorium of the Carroll Club.

Agricultural Stone Rate Lowered in Oklahoma

Oklahoma farmers will get limestone at the lowest freight rate of any state in the United States as a result of negotiations completed early in January by Governor Kerr of that state with Oklahoma railroads as shown in an order issued recently by the Oklahoma State Corporation Commission.

Following a conference with Reford Bond, commission chairman, and C. B. Bee, commission rate attorney, the governor declared the order will bring reductions of as much as 40 per cent. in freight rates on farm limestone in Oklahoma.

This will make limestone available to farmers at less than one-half the present price.

"If agricultural lime is supplied to the cultivated lands of Oklahoma on a scientific basis it will bring an increase in production of at least 25 per cent." the governor said.

Permanente Incorporates "Cement" in Firm Name

The Permanente Corporation, operator of a cement plant near Los Altos, California, will henceforth be known officially as Permanente Cement Corporation.

The change of name has been included in an amendment to its articles of incorporation. E. E. Trefethen, Jr. and G. G. Sherwood, vice-president and assistant secretary, respectively, submitted the amendment.

The decision to make the change had the approval of stockholders representing 28,015 out of 35,000 shares.

Plan Enlargement of Puerto Rico Plant

Following a construction period that began in August, 1941, the new cement plant at Ponce, Puerto Rico started production in September, 1942.

At present the mill has an estimated annual capacity of 350,000 barrels and plans reportedly are underway for further enlargement. It was intended that approximately half the cost of the plant would be supplied by the company and the remainder by the Reconstruction Finance Corporation and a Puerto Rico bank.

Many Non-Essential Jobs Halted to Free Materials for War

Construction projects having a total cost of $1,325,545,454 have been stopped during the past five months to free materials, equipment, and other resources for more essential war uses, the War Production Board has announced.

Of the total number of projects stopped, many were halted voluntarily by the programming agency, while others were ordered stopped after studies by the Facility Review Committee. This Committee was established October 23, 1942, to consider the necessity of construction projects from the point of view of the war effort, location, method of construction, use of critical materials, and consumption in operation of materials, manpower, or services.

Among the types of projects halted during the five-month period were highways both state and national; bird refuges, fish hatcheries, reclamation projects publicly and privately financed power projects, housing, schools, irrigation and others which were not directly associated with the war program.

Seeks Permit to Erect Cement-Storage House

The Kosmos Portland Cement Company, Louisville, has applied for a permit to construct an unloading dock and cement storage facilities on the Ohio River near Constance, Kentucky. The American Aggregates Corporation, Greenville, Ohio, has also applied for a permit to construct temporary unloading facilities for the handling of sand and gravel near the same town.

Tobin Quarries Lease Huge Kansas Deposit

Tobin Quarries of Kansas City has leased 3,040 acres of sand-and-gravel deposits in Seward County, Kansas, and plans to obtain material from this acreage to supply a new air base in that vicinity.

New Gravel Concern at Meriden, Connecticut

The Meriden Washed Sand & Stone Company is reported to have gone into business at Meriden, Connecticut. The firm is incorporated for $50,000. Officials include Douglas Johnson, William J. Smith and George J. Smith.

Fuel Substitutes Sought by Lone Star for Foreign Plants

Sales and operating profit of the Lone Star Cement Corporation in 1942 were greater than ever, but after deducting record high taxes, the consolidated net profit was smaller than it has been since 1938. Although the firm made and sold more cement than in any year since its inception, increases in taxes, wages, and operating costs such as fuel and shipping, left a consolidated net profit of only $3.63 a share applicable to 948,597 shares outstanding on December 3, 1942. This result compares with $4.33 a share in 1941, and $3.54 a share in 1940. Dividends totaling $3.25 a share were paid in 1942, as compared with $4 in 1941 and $3.50 in 1940.

The consolidated net profit for 1942, even though it declined to the lowest point in several years, was attained only because the volume of operations was so large. The domestic operating rate was 87.6 per cent. in 1942, 78 per cent. in 1941, and 52.8 per cent. in 1940.

Changes during the year raised the total capacity for all fifteen plants to 25,000,000 barrels annually. Serious problems were encountered in securing an adequate supply of fuel for the Cuban and South American plants. Due to a scarcity of oil tankers, it was difficult at times to keep these plants operating. When fuel oil was available, it cost more than in times of normal shipping. In December, 1942, oil delivered to the Cuban plant had increased in cost 139 per cent. over December, 1941.

To keep plants operating despite these difficulties, extensive study was made of other fuels. Experiments, some successful and some still in progress, were made with the available surpluses of bran, barley and corn. Other substitutes used were sunflower cake, linseed residue, peat and asphalt. In one plant, two kilns were operated the entire year on substitutes. Prices of some of these materials rose sharply when their value as a fuel was recognized. The total bill for fuel for domestic and foreign use, an important item of manufacturing cost that is approached in amount only by wages, was $6,660,729 in 1942, $5,626,206 in 1941, and $4,196,360 in 1940.

Expenditures totaling $844,840, subject to priorities and directives, have been authorized in 1943 to improve the plants and equipment of Lone Star Cement Corporation and its subsidiaries. This total compares with $1,072,447 spent for this purpose in 1942 and $1,358,472 in 1941.

New York Plants Win Awards for Safety

The Louisville Cement plant in Akron, New York, the National Gypsum plant in Akron and surface operations in Clarence Center, New York, and the Universal Atlas mine in Clarence Center received accident-prevention awards from Associated Industries of New York State Inc. at a dinner sponsored by the Safety Bureau of the Buffalo Chamber of Commerce March 1.

Road Builders Meet in Chicago May 5-7

The annual meeting of the American Road Builders' Association will be held Wednesday, Thursday and Friday, May 5-7, at the Edgewater Beach Hotel in Chicago.

There will be no equipment display as in former years because of war conditions.

Opens New Pit Near Nebraska Air Base

The Scotts Bluff Sand Company at Scotts Bluff, Nebraska, holder of a contract to furnish sand and gravel for the widening of taxiways at the army air base in that city, has opened a new pit a mile west of the city, it has been announced by George Lillie and Wallace Lillie, operators of the company.

Magnesium Plant Is Destroyed by Fire

A fire which burned with blinding brilliance destroyed a magnesium plant at Aberdeen, Washington that has been producing vital war metal for government needs for the last eighteen months.

The destruction of the plant, one of moderate size, was complete. The origin of the fire was not learned.

Buys Gravel Plant on Columbia River

A crushed-stone plant at Rainier, Oregon, formerly owned by the late A. G. Held, has been purchased by the firm of Holt & Murphy, a new sand-and-gravel concern in that area.

The transaction involved the Columbia River plant's machinery, building, trackage and docks.

Big Canadian Dam Rivals Boulder in Size, Construction

A huge hydro-electric dam which virtually duplicates Boulder Dam in size is nearing completion in Canada and details of its construction were revealed only recently because of censorship restrictions.

The plant and dam are situated in northern Quebec on the Shipshaw River, a tributary of the Saguenay. It is not far from the aluminum-producing center Arvida, and the power will be used to help increase the output of the metal from 50,000 to 500,000 tons a year. The Aluminum Company of Canada financed its construction, and the cost of $65,900,000 will be defrayed by contracts for the sale of aluminum to the United States and Great Britain.

Upon completion, the powerhouse will contain twelve generating units, each of which will develop about 100,000 horsepower.

Work on the project was started on October 1, 1941, and was carried on through two winters in a section where temperatures down to 50 degrees F below zero are not uncommon. At the peak of activities, 10,595 men were employed and the payroll amounted to $1,771,000 a month. Some idea of the magnitude of the job may be gained from the following construction quantities: total material excavated, 5,731,000 cubic yards; concrete used, 1,024,000 cubic yards; reinforcing steel needed, 14,109,120 pounds; explosives consumption, 3,240,000 pounds; concrete-mixing capacity, 7,800 cubic yards a day.

Approve Pension Plan for Gypsum Workers

A pension plan for all employes of the National Gypsum Company providing for retirement at 65 on an annuity of approximately one-third of salaries up to a limit of $21,000, was approved by stockholders at the annual meeting in the company's offices in Buffalo.

The pension plan supplements other company pension plans in effect previously.

Wisconsin Charter Is Sought by Duluth Firm

The Clearwater Gravel Company, Duluth, has filed articles of incorporation in Wisconsin. The proportion of the firm's paid in capital stock represented in Wisconsin is placed at $5,000.

19 States Plan to Build Super Roads After End of War

Twelve states already have the necessary laws and seven others are now considering legislation that will enable them to build the express "highways of tomorrow" when peace comes, Commissioner Thomas H. MacDonald of the Public Roads Administration of the Federal Works Agency has announced.

These future highways were described as "limited-access roads designed to serve through traffic rather than abutting property." The Pennsylvania Turnpike and the Merritt Parkway in Connecticut are early examples. Traffic is permitted to enter and leave them only at certain selected points. These particular highways are toll roads, but limited access is contemplated, for the future, for non-toll roads as well.

"Many states cannot now build these advanced motorways," Commissioner MacDonald pointed out, expressing the hope that they will enact enabling legislation so that advance planning can begin. He added: "Statutes limiting road widths inherited from the horse-and-buggy days, for example, often prevent acquisition of adequate rights-of-way for the broad, uninterrupted arteries required by modern, high-speed vehicles.

"Limited-access facilities are also unattainable without special legislation because of the common-law right of access of abutting property owners to a public highway. Even when a heavily-traveled road is located through an undeveloped area, it is soon lined with a variety of establishments, each one exercising its right of direct entry. Driving down this busy avenue then is like running the Indian gantlet of pioneer days. Only by law can access be limited and a highway made safe and suitable for modern traffic."

States now legally prepared to construct limited-access highways are: California, Colorado, Connecticut, Louisiana, Maine, Maryland, Michigan, New York, Ohio, Rhode Island, Virginia and West Virginia.

California and New York are actually developing detailed plans and specifications for limited-access highways for post-war construction. This advance engineering work is a joint federal-state undertaking which is being financed from a special $10,000,000 fund authorized in the Defense Highway Act of 1941 and from state fund.

States with limited-access-highway legislation under consideration include Arizona, Delaware, Massachusetts, New Hampshire, New Jersey, New Mexico and Utah.

Many Plants Honored in New Jersey Campaign

New Jersey plants of Johns-Manville Corporation and the Flintkote Company were among the group winners in the 15th annual statewide interplant safety contest which was conducted during the last quarter of 1942 under sponsorship of the New Jersey State Department of Labor.

Winners of certificates for perfect safety records during the competition, included plants of United States Gypsum Company, Camden Lime Company, Lock Joint Pipe Company, Massey Concrete Products Corporation and Newark Plaster Company.

Baker, Graves, Tompkins on NAM Committee

Quarry - industry representatives were included in the membership of the post-war committee of the National Association of Manufacturers, which has made public a comprehensive report outlining "the principles necessary for postwar prosperity."

Members of the committee included Stirling Tomkins, president, New York Trap Rock Corporation; Melvin H. Baker, president, National Gypsum Company; Otho M. Graves, president, General Crushed Stone Company, and other industrialists from all sections of the country.

E. J. Tyler Heads New Sand-and-Gravel Firm

The Rutherford Minerals Corporation of Richmond, Virginia, has filed articles of incorporation with the State Corporation Commission at Richmond, showing a maximum capital of 500 shares of no par value.

E. J. Tyler of Washington, D. C., is president of the concern. The company will engage in producing and processing gravel and sand.

Wabash River Operator Seeks Dredging Permit

Renewal of its federal dredging permit is being sought by the Eastwood Sand & Gravel Company of Grayville, Illinois. The company operates on the Wabash River.

Universal Plant at Northampton Will Open Early in June

The Universal Atlas Cement Company plant at Northampton, Pennsylvania, was closed on April 30 to await opening, about June 1, of its new plant now under construction in the immediate vicinity.

The new production unit is being constructed at a cost of $10,000,000. The present plant, in operation since 1894, employed 800 men during peak operations. The new plant will employ approximately 300 workers.

Replacement of the present plant has been included in a modernization and rehabilitation program launched five years ago by the company, which also operates mills at Hudson, New York; Leeds, Alabama; Universal, Pennsylvania; Buffington, Indiana; Duluth, Minnesota; Hannibal, Missouri; Independence, Kansas and Waco, Texas.

Both Portland and white cements will be produced in the new unit, the output of which will exceed the daily capacity of the former plant, which had been 12,500 barrels of Portland and 1,600 barrels of white.

The Northampton plant was originally known as the Keystone Cement Company. In 1890 the name was changed to the Atlas Portland Cement Company. In 1930 Atlas became a subsidiary of United States Steel Corporation and has since been called the Universal Atlas Cement Company.

Many of the outstanding developments of the industry were pioneered at the Northampton plant. A predecessor unit of Universal Atlas is said to have been first to develop and use the rotary kiln. The Northampton plant was one of the first to make commercial use of powdered coal in the production of clinker.

The use of gypsum to regulate the setting time of Portland cement also received initial use at Northampton. Atlas mills pioneered in the manufacture of special cements and the Lehigh Valley plant early developed the use of granulated blast-furnace slag instead of clay or shale in cement production.

Aggregates Company Has Best Year in History

Pacific Coast Aggregates, Inc., experienced the best year in its history during 1942, with an increase of 80 per cent. in sales and an even greater gain in net profits. Sales totaled $6,103,075, a gain of $2,708,662 over 1941 sales of $3,384,413. The net profit for 1942 was $545,380.

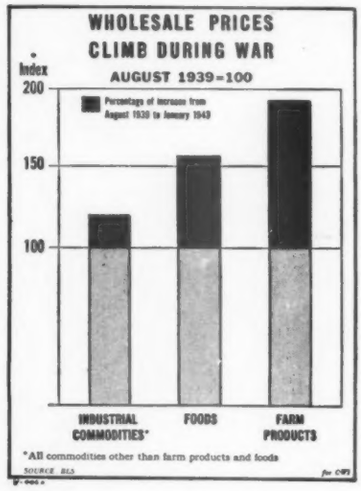
CURRENT BUSINESS INDICATORS

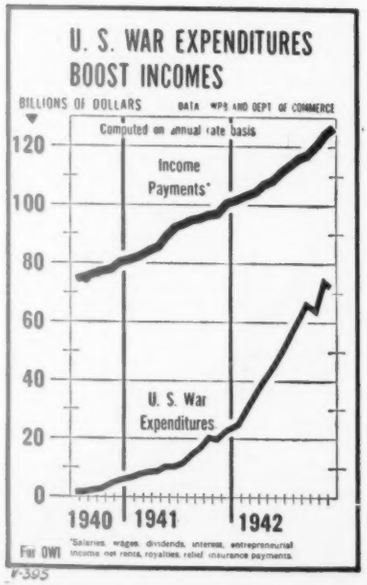
another P-Q and exclusive

The hold-the-line Executive Order on wages, prices, and job movements issued by President Roosevelt on April 8 brought quick action from the several government agencies concerned with economic stabilization.

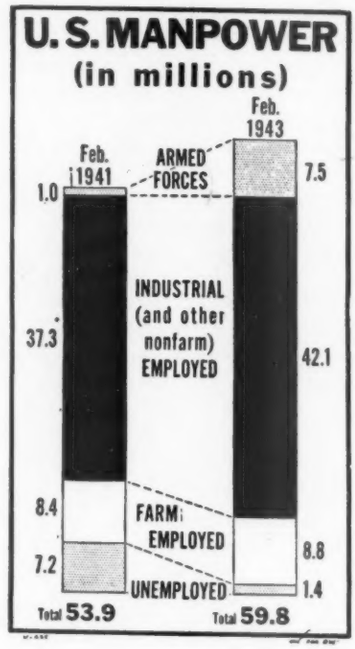
In accordance with the stipulation of the President's order, the War Labor Board announced that it would approve no further increases in wage rates or salary scales beyond those provided in the "little steel" formula except in those cases where corrections of sub-standards of living were clearly involved. Under this exception wages of less than 40 cents an hour may still be moved up to that level with War Labor Board approval. Where wages are above the 40-cent level, the War Labor Board is still free to increase the wage rates for a particular job classication up to 15 per cent. above the January 1, 1941 rates. This ceiling will not be relaxed even in cases where gross inequities or inequalities are demonstrated; although rises in such instances were previously permitted. However, adjustments of wages and salaries for promotions, reclassifications, and merit increases will be allowed under the new regulations. Bonus payments awarded as incentives to increased efficiency are gaining favor in the War Labor Board and other government agencies as a means of increasing productivity and meeting the man power shortage, without cracking the new rigid wage-stabilization policy. Stabilization Director Byrnes has already approved a number of incentive payment plans originating in the War Production Board, and a wide extension of the system is anticipated in the immediate future.

In a move designed to support the check on wage increases, and at the same time to curtail labor pirating and the concomitant high rate of labor turnover which have exerted an adverse influence on war production, Manpower Chairman Paul V. McNutt issued a sweeping order restraining the right of the 27,000,000 workers engaged in essential employment to shift to other jobs. This order was promulgated to implement the authority granted to the War Manpower Commission in the President's edict. The new man power order prohibits the movement of workers, who have been employed in essential activities during the preceding 30 days, to other jobs at an increase in pay, whether or not the new jobs are essential. Covered by the order are the 18,000,000 industrial employees engaged in activities designated as essential by the War Manpower Commission and about 9,000,000 farm workers.





While the primary aim of the order was to buttress the President's anti-inflation program, a secondary purpose was to forestall the enactment of national labor-service legislation over which there has been so much controversy in the last few months. The new "job freeze" for essential workers, however, leaves much to be desired as far as an effective system of man power control is concerned. No restrictions are placed on movement between jobs at the same rate of pay, nor is any provision made for directing the movement of workers from non-essential employment; the latter group are equally free to enter either essential work or other non-essential work, regardless of pay scales. Furthermore, in the 60 areas in which the WMC has established employment-stabilization plans transfers of essential workers to higher-paying jobs are permissible if they are deemed to be "in the interest of the war effort." These job-transfer privileges are soon to be extended to virtually all other areas as well. While the ultimate criterion of value to the war effort is entirely desirable, it is left to administrative determination whether this provision will serve as a major loophole for the thawing of the intended freeze.



A further weakness lies in the fact that the order draws no distinction between essential civilian production and direct war production. The latter is certain to be favored by most local man power officials, and further curtailment of civilian output below present levels may be expected as a result of increased pressure from this source. At the present time civilian industrial production is lower than in the 5-year period preceding the outbreak of the war in 1939, when war production represented a negligible part of industrial output. By the spring of 1943, however, the Federal Reserve index of industrial production stood at 205 (1935-1939 = 100), war production accounting for almost two-thirds of the total.

AUTOMOTIVE REPAIR PARTS FREED.—Automotive replacement parts and automotive maintenance equipment have been removed from the list of items to the purchase of which preference ratings, assigned under Controlled Materials Plan Regulations Nos. 5 and 5A, may be applied, the War Production Board announced April 18. The action with respect to automotive replacement parts was taken in order to restore the system of free distribution of parts which existed prior to the issuance of the CMP maintenance, repair, and operating supplies regulations. This is necessary because not all essential transportation operations were assigned equal ratings under regulations. Now all motor-carrier transportation are on an equal footing with respect to securing repair parts. This does not affect the requirement, however, that used parts be turned in when new ones are purchased.

CEMENT-PLANT CONVERSION SUGGESTION.—On March 24 the Concrete Materials Section of the Construction and Utilities Bureau of WPB sent the following letter to all cement manufacturers:

WAR PRODUCTION BOARD
CONSTRUCTION AND UTILITIES BUREAU
WASHINGTON, D. C.
March 24, 1943

To All Cement Manufacturers:

With non-essential construction eliminated and with the bulk of essential civilian and war construction nearing completion, the cement industry will probably be called upon to supply only approximately 108,000,000 barrels of cement for domestic use in 1943. There will, in addition, be some cement exported, but even with this additional requirement as we get further into the year 1943, cement demand will be at about 50 per cent. of potential capacity.

This demand may be unevenly distributed over the nation. Some areas will require the greater percentage of local cement production while large surplus capacity will exist in other areas. In the latter case, some plants will operate at a considerably reduced rate while other plants may close down for extended periods, if their facilities can not be used for manufacturing other war materials.

Therefore a number of cement manufacturers may wish to use their machinery for continued direct contribution to the war effort. It has been suggested that cement-making machinery can be converted to various other uses, such as nodulization or agglomeration of iron ore for open-hearth and blast furnaces, production of sponge iron or pig iron, calcination of petroleum coke, dolomite and limestone, drying and calcining of bauxite, clay, manganese ore, phosphate ore, etc. In some of these processes crushing, grinding and flotation equipment, as well as wet or dry classification machinery, may also be called for.

In the event you are interested in converting your plant in whole or in part to the manufacture of war materials other than cement, please give us the necessary details and we shall be pleased to assist you as much as possible in disseminating this information among the various war agencies.

This section has, from time to time, been requested to assist in locating available second-hand cement kilns which could be used in other industries, making essential war materials. Utilization of this type of equipment saves critical materials and conserves valuable man hours in fabricating similar new equipment. If you have any kilns which are idle and which you do not expect to operate again and if you care to list them with us, we will use such information in handling inquiries for this type of equipment.

FRANCIS A. MCADAMS,
Chief, Concrete Materials Section.

On April 2 the following letter was sent to cement manufacturers:

WAR PRODUCTION BOARD
WASHINGTON, D. C.
April 2, 1943.

It has been estimated that the domestic consumption of Portland cement in 1943 will amount to 107,788,000 barrels. In addition to this some cement will be needed for direct military construction outside continental United States and for export to foreign countries.

In the attached table the aforementioned domestic cement requirements have been broken down by the 12 Bureau of Mines Districts and compared with domestic cement shipments by destination in 1942. Although the figures represent the best forecast that can be made at this time, the location and character of construction are necessarily subject to some degree of change in accordance with developments in the military situation. We trust, nevertheless, that these figures may be of some use to you.

J. L. HAYNES,
Director, Building Materials Division.
FRANCIS A. MCADAMS,
Chief, Concrete Materials Section.

DOMESTIC CONSUMPTION OF PORTLAND CEMENT, 1942 and 1943
(Thousands of barrels)

Bureau of Mines Districts (States)	Domestic Consumption 1942[1]	Percentage of Total National Consumption 1942	Estimated Domestic Requirements 1943[2]	Percentage of Total National Requirements 1943	Percentage of Actual Increase or Decrease from 1942 to 1943[3]
1 D. C., Delaware, Maryland, New Jersey, Eastern Pennsylvania	15,220	8.6	11,165	10.4	—27
2 Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont	18,898	10.7	11,210	10.4	—41
3 Ohio, Western Pennsylvania, West Virginia	14,708	8.3	8,635	8.0	—41
4 Michigan	7,130	4.0	3,545	3.3	—50
5 Illinois, Indiana, Kentucky, Wisconsin	21,345	12.0	11,110	10.3	—48
6 Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia	30,733	17.3	19,680	18.2	—36
7 Iowa, Minnesota, Eastern Missouri, South Dakota	8,974	5.0	3,720	3.5	—59
8 Arkansas, Kansas, Western Missouri, Nebraska, Oklahoma	16,593	9.4	8,070	7.5	—51
9 Texas	11,402	6.4	5,575	5.2	—51
10 Colorado, Idaho, Montana, New Mexico, Utah, Wyoming	6,551	3.7	3,990	3.7	—39
11 Arizona, California, Nevada	20,086	11.3	14,878	13.7	—26
12 Oregon, Washington	5,840	3.3	6,210	5.8	+ 6
Totals	177,480	100.0	107,788	100.0	—39

[1]Figures based on monthly publications by the Bureau of Mines.
[2]Total requirements for 1943 of 107,788,000 barrels estimated by Construction Research Section, Statistics Division, February 15, 1943. Geographical distribution based on estmated construction activity by states in 1943.
[3]Shows the actual increases or decreases by Districts. Total decrease for the country: 39 per cent. for 1943, compared with 1942.
All Districts except No. 12 will require less Portland cement in 1943 than in 1942. The decreases in Districts 1, 6, and 11 are less than the national average of 39 per cent.; consequently these districts, as well as District 12, will show an increased percentage of the national total, as indicated by comparing columns 3 and 5. The largest percentage decreases are expected in Districts 7, 8 and 9.

CONSTRUCTION EQUIPMENT ORDER AMENDED—Production and sale of certain types of construction machinery and equipment are prohibited and other specified types may be produced only for the armed forces and Lend-Lease purposes under the terms of Limitation Order L-192 as amended April 19 by the War Production Board.

The amended order, which affects all items of construction machinery and equipment (over a hundred types), to some extent tightens the controls imposed by the original order issued November 7, 1942.[1] It sets up four schedules (in place of the former three) in which specified items are grouped according to the degree and nature of the limitations and restrictions.

The demand and supply situation for construction equipment for both military and civilian use has changed during the five months since L-192 was first issued; so also have production and conservation problems. These changes are reflected in the revised placement of items in Schedules A, B, and C, and in the addition of Schedule D.

Production of items listed in Schedule D—which includes specified types of graders, scrapers, joint levellers, and also includes reference to the sizes and models prohibited by schedules of L-217—is prohibited on and after May 1.

Schedule C lists items which may be ordered and produced only for war agencies, *i.e.*, the armed forces, the Canadian Department of Munitions and Supply, and foreign governments under the Lend-Lease Act. Among the 40 items in Schedule C are specified types of roads disks, dredges, graders, road rollers, sweepers, towers, etc.

The items grouped together in Schedule A come next from the viewpoint of degree of control. Civilian purchase orders for these items are subject to approval by the WPB, which establishes preference ratings and all other conditions under which purchase orders may be placed.

Applications for civilian purchase orders are made through WPB regional offices where construction-machinery specialists determine if satisfactory used equipment is available.

Included in the 52 items on Schedule A are angledozers and bulldozers, ladder and wheel ditchers, and specified types of concrete mixers, bituminous patch plants, pumps, power shovels, etc.

No restrictions on purchase orders are imposed on the items listed in Schedule B except applicable provisions of other

[1]See *Construction Equipment Allocated*, PIT AND QUARRY, December 1942, pages 30-32. —ED.]

WPB regulations, such as Priorities Regulation No. 1 and the various schedules of L-217. Among the 27 items listed in Schedule B are buckets, drills, mixers, pumps and sprayers of specified types.

Earlier provisions governing production schedules are retained in the amended order, with minor changes permitting greater freedom in production schedules for Schedule B items. Monthly inventory reports are required, as in the original order, and control over sale and delivery, use, resale, etc., of new equipment also remains substantially the same, that is, subject to approval by WPB.

In order to encourage full utilization of existing equipment certain changes have been made in the procedure governing repair parts. Parts needed for actual or impending breakdowns or maintenance are obtainable upon certification that they are to be used for this purpose and that the item to be repaired has been registered as required by Limitation Order L-196.

In the case of equipment used on "essential projects," the highest rating carried by the project may be assigned to the purchase order for repair parts. (Essential projects are construction projects by or for a war agency or the Defense Plant Corporation, or any construction project with a preference rating of A-1-k or higher under any order in the P-19 series.)

The former restriction of purchase orders for repair parts to 5 per cent. of the price of the equipment has been removed. The amended order limits delivery of repair parts to war agencies to not more than 75 per cent. of a producer's combined production and inventory in any one month if delivery in excess of 75 per cent. would prevent filling civilian orders on hand. Parts for reconditioning or rebuilding used equipment are also subject to authorization by WPB but parts for this purpose used by war agencies, or war agency contracts or for mines are exempted.

The full text of the amended order follows:

PART 1157—CONSTRUCTION MACHINERY AND EQUIPMENT

[Limitation Order L-192 as Amended April 9, 1943]

The fulfillment of requirements for the defense of the United States has created a shortage in the supply for defense, for private account and for export, of rubber and other materials used in the production of construction machinery and equipment and repair parts; and the following order is deemed necessary and appropriate in the public interest and to promote the national defense:

§ 1157.10 *Limitation Order L-192*— (a) *Revocation of Limitation Order L-82 and L-82-a.* This order, as of November 30, 1942, supersedes Limitation Orders Nos. L-82 and L-82-a. Notwithstanding the revocation of Limitation Orders Nos. L-82 and L-82-a issued November 7th, 1942, every person subject to the terms thereof immediately prior to such date shall abide by the terms of such orders until November 30, 1942, as though their text were full incorporated in this order.

(b) *Applicability of regulations.* This order and all transactions affected thereby are subject to all applicable Regulations of the War Production Board, as amended from time to time.

(c) *Definitions.* (1) "Person" means any individual, partnership, association, business trust, corporaton, governmental corporation or agency, or any organized group of persons, whether incorporated or not.

(2) "Producer" means any person engaged in the manufacture of equipment.

(3) "Equipment" means that construction machinery and equipment listed in Schedules A, B, C, and D attached hereto, but shall not include any equipment on rubber tired chassis or running gear built for or usable for the transportation of commodities or persons.

(4) "New", when applied to equipment, means any equipment which has never been received or accepted by any person acquiring it for use.

(5) "Repair part" means any part manufactured for use in the repair and maintenance of equipment; but does not include components or attachments which change the functional operations of the equipment as originally shipped.

(6) "War agency" means the Army, Navy, Maritime Commission, War Shipping Administration, Canadian Department of Munitions and Supply, and the government of any foreign country receiving aid pursuant to the Act of March 11, 1941, entitled "An Act to Promote the Defense of the United States" (Lend-Lease Act).

(7) "Essential project" means a construction project undertaken by, or contracted by or for the account of a war agency or the Defense Plant Corporation, or any other construction project granted a preference rating of A-1-k or higher under any order in the P-19 series; but does not include any mine operating under a serial number of Preference Rating Order P-56.

(8) "Rubber" means all kinds of natural, reclaimed and synthetic rubber.

(d) *Procedure for Placing and Receiving Equipment Orders*—(1) *For Schedule A equipment.* No person shall place or accept any order for new equipment listed in Schedule A except according to the following procedure:

(i) Every person, except a war agency, desiring to place such an order shall file an application for authorization to purchase on Form PD-556 in quintuplicate with the War Production Board regional office in the region in which such person desires to use such equipment. Such application when approved by the War Production Board shall establish all conditions under which such order may be placed with the supplier including the assignment of preference ratings if not previously granted.

(ii) Every persons, except a war agency who applies for such equipment by filing Form PD-556, thereby makes representation that he has complied with all the terms of Limitation Order L-196 as amended.

(iii) A war agency shall furnish the Construction Machinery Division, War Production Board, Washington, D. C., with Form PD-556 made out in duplicate at the time that any order for such equipment is placed with a producer.

(iv) No person shall accept an order for such equipment from any person except a war agency, unless such order is accompanied by such authorization on Form PD-556.

(2) *For Schedule B equipment.* Nothing in this order shall prevent any person from placing or accepting an order for new equipment listed in Schedule B, subject to all applicable regulations of the War Production Board.

(3) *For Schedule C equipment.* (i) No person, except a war agency, may place an order for new equipment listed on Schedule C, and no person may accept such an order unless it is placed by a war agency and accompanied by an authorization to purchase on Form PD-556.

(ii) A war agency must file an application for authorization to purchase such equipment on Form PD-556 in quadruplicate with the Construction Machinery Division, War Production Board, Washington, D. C. A war agency may also file such an application for such equipment for use by a prime contractor on a construction project for such agency.

(4) *For Schedule D equipment.* In addition to such limitations and prohibitions as may be imposed by Order L-217 and all schedules thereto, on and after June 1, 1943, no person shall place or accept any order for new equipment listed in Schedule D.

(e) *Restrictions on production of equipment.* (1) No producer shall use or put into process any materials for the production or assembly of

(i) Any new equipment except in accordance with such production schedules as may be approved by the War Production Board as provided in paragraph (f) hereof;

(ii) Any new equipment designed for or requiring rubber tires except to fill an order placed by a war agency or unless the authorization on Form PD-556 required by paragraph (d) hereof specifically so provides;

(iii) Any parts to be physically incorporated into new equipment in excess of those required by approved production schedules: *Provided*, That this subparagraph (e) (1) (iii) shall not apply to the production of repair parts or components or attachments;

(iv) Any new equipment listed in Schedule C, except to fill an order authorized by the War Production Board on Form PD-556 pursuant to paragraph (d) (3) hereof.

(2) In addition to such limitations and prohibitions as may be imposed by Order L-217 and all schedules thereto, on and after May 1, 1943, no producer shall use or put into process any materials for the production or assembly of any equipment listed in Schedule D.

(f) *Production schedules.* (i) On or before November 25, 1942, and on or before the 15th day of each succeeding calendar month, every producer shall file in quadruplicate on Form PD-697 a statement of his production for the previous month and his proposed production schedule of all new equipment projected for all additional monthly periods for which production may be planned. Approval or modification of such production schedule of all new equipment for the three calendar months succeeding such filing, or for such shorter time as production may be planned, will be indicated on an approved copy of said Form PD-697 returned to such producer prior to the first day of the calendar month succeeding such filing. Except as provided in paragraph (f) (2) hereof, no producer shall change his production schedules as approved or changed by the War Production Board without specific authorization of the War Production Board.

(2) Any producer of new equipment listed in Schedule B may produce all or any one or more items of such equipment appearing on his approved production schedules on Form PD-697 at any time during the months for which the schedules were approved and need not therefore in that regard produce in strict accordance or sequence with the individual monthly production schedules approved: *Provided*, That the total quantity of each item produced during such period shall not exceed that authorized on such approved schedules.

(g) *Inventory reports.* On or before November 25, 1942, and on or before the 15th day of each succeeding calendar month, every producer shall file in quadruplicate on Form PD-697, a statement of finished unsold inventory, as of the last day of the preceding calendar month, of new equipment including that in the possession of his dealers and distributors. Every dealer and distributor, on the fifth day of the month, shall report his inventory of new equipment as of the last day of the preceding calendar month to the producer from whom such equipment was purchased, or, if not purchased, to the producer for whom the distributor or dealer is acting as agent.

(h) *Prohibiting transfer and use of new equipment.* On and after November 30, 1942, no producer shall use for other than experimental or demonstration purposes, or sell, lease, trade, lend, deliver, ship or transfer, any new equipment and no person shall accept the same unless

(1) Such equipment is then in transit to such person, or

(2) Such use, sale, lease, trade, loan, delivery, shipment or transfer has been specifically approved by the War Production Board as follows:

(i) On or before November 25, 1942, and on or before the 15th day of each succeeding calendar month, every producer shall file in quadruplicate on Form PD-697 a statement showing his proposed delivery schedule of all unfilled orders of new equipment, his shipments made during the calendar month previous to filing, and also his shipments during the current month to the date of filing. Approval of a delivery schedule of all new equipment for the calendar month succeeding such filing, whether or not such equipment is actually shipped during that month, will be indicated on an approved copy of said form returned to such producer prior to the first day of that month.

(ii) The delivery of all new equipment as scheduled for delivery on or before November 30, 1942, and previously authorized under Limitation Orders L-82 and L-82-a, shall be deemed to be authorized, unless the War Production Board shall otherwise direct.

(iii) The War Production Board may at any time revoke any delivery authorization provided for in subparagraphs (h) (2) (i) or (h) (2) (ii) above as to any or all new equipment included therein, direct or change the schedule for deliveries of any equipment, allocate any order for any new equipment listed on a producer's Form PD-697 to any other producer, or direct the delivery of any new equipment to any other person, at regularly established prices and terms.

(iv) Except as provided in subparagraph (h) (2) (v) hereof, and notwithstanding any preference rating heretofore or hereafter granted no producer shall change his schedule of deliveries of any new equipment as approved or changed by the War Production Board, without specific authorization of the War Production Board.

(v) Any producer may deliver any item of

new equipment listed in Schedule B to the amount permitted by approved production schedules regardless of his schedule of deliveries of such equipment as listed on his current Form PD–697. Such deliveries shall be subject to all applicable Regulations of the War Production Board.

(i) *Restrictions on resale, rental and use.* (1) Every person, except a war agency, to whom delivery of any new equipment listed in Schedule A or C has been authorized pursuant to this order, must use such equipment on the project described in the authorization to purchase and will be subject to the provisions of paragraphs (i) (2) and (i) (3) hereof.

(2) Every person, except a war agency, thirty days prior to the sale, lease or use on any other project of such equipment, shall complete, sign and return Form WPB 1333 to the Used Construction Machinery Regional Specialist in the War Production Board Regional office in the region in which the PD-556 was originally approved for such equipment.

(3) The War Production Board at any time on two weeks' written notice may require any such person who owns such equipment to sell, lease, or use such equipment as directed.

(4) Nothing in this order shall be deemed to affect the applicability of Limitation Order L–196.

(j) *Procedure and restrictions on sale and delivery of repair parts*—(1) *Repairs for actual or impending breakdown or maintenance.* (i) No producer, dealer, or distributor shall sell or deliver repair parts for actual or impending breakdown or for maintenance of equipment in sound working condition to any person other than another producer, dealer, or distributor, unless such person has furnished the informaton and certification called for below in a writing signed by such person and in substantially the following form:

This order covers Repair Parts needed for actual or impending breakdown or maintenance of ..... which has been registered under L–196. Model Number ..... Serial Number ..... Rating ..... Project Identification ..... (Under project identification, if for War Agency give prime contract number of project otherwise state type of work for which parts are intended, e. g., mining, highway construction, housing, etc.)
in accordance with Limitation Order L–192 with the terms of which I am familiar.

Date .....
Purchaser
By: .....

Such certification shall constitute a representation to the War Production Board that such repair parts are required for the purpose of repair of actual or impending breakdown or maintenance of the particular equipment, and, unless the applicant is a war agency, that the applicant does not have parts available or on order for this purpose and that such applicant has registered the equipment for which the repair parts are sought in accordance with the provisions of Limitation Order L–196 providing for registration of used construction equipment. This certification shall, for the purposes of this order, supplant the certification required in Preference Rating Order P–100.

(ii) No person, except a producer, dealer, distributor, or a war agency, shall purchase for stock or inventory repair parts (in excess of that required for the purpose of repair of impending breakdown or for maintenance of equipment in sound working condition on the current job, without specific authorization of the War Production Board on Form PD–556 submitted in duplicate. On such Form PD–556 the applicant must supply under section 5 thereof, adequate reasons why this stock or inventory must be acquired, which shall include the following information: quantity, make and model number of equipment for which parts are intended, present inventory of such parts, duration and preference rating of project on which such equipment is now working, and the distance from normal source of supply for such repair parts.

(iii) All orders for repair parts for actual or impending breakdown or maintenance of equipment in use on essential projects, as defined in paragraph (c) (7) hereof, shall carry the highest preference rating of such project. However, this subparagraph (j) (1) (iii) shall not be construed to prevent the use of any higher individual rating which may be authorized for emergency repairs pursuant to any regulation, order, or directive of the War Production Board.

(2) *Repair parts for reconditioning or rebuilding used equipment.* No producer, dealer, or distributor shall sell or deliver repair parts for purposes of reconditioning or rebuilding used equipment (except to a war agency, or to a person who has contracted to recondition or rebuild equipment owned by a war agency and to whom such war agency has properly extended a preference rating, or to a mine operating under a serial number of preference rating Order P–56), unless the order for such repair parts is accompanied by an authorization of the War Production Board, application for which shall be on Form PD–556 submitted in duplicate listing individually the repair parts requested and their approximate value.

(3) *Spares.* Orders for repair parts intended to be used as spares for new equipment listed in Schedules A and C shall be placed with the producer at the same time as the order for such new equipment, and shall be listed on the Form PD–556 on which such new equipment is requested.

(4) No producer shall deliver to war agencies in any one month, any repair part whatsoever in excess of seventy-five (75) percent of his combined production and inventory of such repair part during such month if such delivery would prevent deliveries of such repair part to fill orders properly placed by other persons, pursuant to provisions of paragraphs (j) (1), and (3) above, without specific authorization of the War Production Board on Form PD–556. "Other persons" as used in this paragraph (j) (4) shall not include dealers or distributors who have ordered such repair part for their stock or to fill orders not yet sold.

(k) *Substitution and conservation of critical materials.* In the manufacture of any item of equipment or repair parts, no producer shall use any alloy steel, stainless steel, aluminum, magnesium, copper, brass, bronze, zinc, nickel, tin, cadmium, or frabricated rubber products where the use of other less critical materials will not impair the efficiency of operation of such item.

(l) *Records.* All persons affected by this order shall keep and preserve for not less than two (2) years accurate and complete records concerning inventories, purchases, production and sale.

(m) *Audit and inspection.* All records required to be kept by this order shall upon request, be duly submitted to aulit and inspection by duly authorized representatives of the War Production Board.

(n) *Violations.* Any person who wilfully violates any provision of this order or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any department or agency of the United States is guilty of a crime, and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using, material under priority control and may be deprived of priorities assistance.

(o) *Appeals.* Any appeal from the provisions of this order shall be made by filing a letter in triplicate referring to the particular provision appealed from and stating fully the grounds of the appeal.

(p) *Communications.* All communications concerning this order, except where specific reference is made therein to the contrary, shall be addressed to Construction Machinery Division, War Production Board, Washington, D. C., Ref: L–192.

Issued this 9th day of April 1943.

WAR PRODUCTION BOARD,
By J. JOSEPH WHELAN,
Recording Secretary.

SCHEDULE A

Angledozers and modifications thereof
Bulldozers and modifications thereof
Conveyors, construction material, portable belt type and for portable plants
Cranes, crawler mounted power
Cranes, tractor mounted power
Cranes, rubber tired mounted power, except freight handling lift trucks
Crushers, gyratory and cone portable type.
Crushers, jaw (sizes 9" x 14" to 30" x 44" openings, inclusive); except those intermediate sizes as indicated in Schedule D (Ref. L–217), and except those sizes of a type designed exclusively for mining and smelting
Crushers, roll, construction aggregates, portable type, except those sizes and types as indicated in Schedule D (Ref. L–217)
Crushing plants, portable type
Derricks, guy, contractors and materials handling, stationary type
Derricks, stiff leg, contractors and material handling, stationary type
Distributors, bituminous
Ditchers, ladder
Ditchers, wheel
Draglines (see cranes)
Draglines, slack line
Draglines, walking
Drilling machines, blast hole drills, churn drill type
Drilling machines, rock portable mounted
Dryers, construction aggregate
Excavators (see power shovels)
Finishers, concrete
Finishers, bituminous paving
Grapples
Hammers, pile
Heaters, and circulators, tank car
Jacks, mud
Loaders, portable bucket (other than coal)
Loaders, portable snow
Logging arches, tractor drawn
Mixers, aggregate pulverizer
Mixers, agitator concrete truck type, except those sizes and types as indicated in Schedule D (Ref. L–217)
Mixers, concrete truck mounted with elevating towers
Mixers, concrete construction, above 7 cubic feet except those sizes and types as indicated in Schedule D (Ref. L–217)
Pavers, concrete
Plants, stabilizing
Plants, asphalt, including travel mix type
Plants, bituminous patch, hot or cold mixer type (more than 10 ton per hour capacity)
Plows, snow (rotary and blower types)
Power control units for tractors (both cable and hydraulic)
Pumps, concrete, except for well cementing
Pumps, portable engine or electric-motor-driven pumping units mounted on skids, with or without handles, or trailer mounted larger than 90,000 gallons per hour, self-priming centrifugal pumps, horizontal or vertical triplex piston road pumps, ordinarily used for contractor's purposes or by contractors for dewatering and supply, as defined and approved in contractors pumps standards by the Associated General Contractors of America, Inc. (A. G. C.) February 21, 1941; except those sizes and types as indicated in Schedule D (Ref. L–217)
Rippers, road
Scrapers, carrying and hauling, both drawn and self-propelled, except sizes listed in Schedule D
Shovels, crawler mounted power
Shovels, rubber tired mounted power
Shovels, tractor mounted power
Sprayers, (maintenance units) bituminous material (over 300 gallon capacity)
Spreaders, concrete
Wagons, contractors crawler
Winches, tractor and truck mounted

SCHEDULE B

Backfill tampers
Breakers, paving
Buckets, clamshell
Buckets, concrete
Buckets, dragline
Buckets, orange peel
Buckets, scraper (bottomless) for dragline operation
Clay diggers
Derricks, small stiff leg, guy, pole, tripod, and setter types with hand power hoists or winches of not over 4 ton maximum capacity.
Drills, jack hammer
Drills, rock, except portable mounted
Form tamping, and pulling machines
Heaters, asphalt surface.
Heaters, concrete mixer
Hoists, contractors and material handling, hand type and power driven having specifications not exceeding 6,000 pounds line pull at 200 FPM line speed or not exceeding 1,300,000 foot pounds effort based on second wrap of cable
Joint and crack filling machines
Kettles, bituminous heating
Mixers, concrete construction, 7 cubic feet and smaller; except those sizes and types as indicated in Schedule D (Ref. L–217)
Mixers, plaster and mortar
Paving breakers
Plants, bituminous patch, hot or cold mixer type (10 ton per hour capacity and under)
Pumps, portable engine or electric motor driven pumping units, mounted on skids, with or without handles, or trailer mounted 90,000 gallons per hour and smaller self-priming centrifugal pumps, plunger pumps, or diaphragm pumps ordinarily used for contractors for dewatering and supply as defined and approved by the Associated General Contractors of America, Inc. (A. G. C.) February 21, 1941, excluding farm type, industrial type and underwriters approved fire fighting pumps; except these sizes and types as indicated in Schedule R (Ref. L–217)
Screen, rotary, vibrator and gravity types, other than coal, mining, industrial or those for screening mud on well drilling, used as a component part of or replacement for a portable crushing, screening or mashing plant
Sprayers, (maintenance units) bituminous material (300 gallon capacity and smaller)

Spreaders, aggregate
Vibrators, concrete
Winches, contractor (see hoists)

SCHEDULE C

The items of equipment appearing in Schedule C may be ordered and produced only for military purposes as provided in paragraphs (d) (3) and (e) (1) (iv).

Batchers, construction material
Batching plants, construction type
Bins, construction material, portable
Bins, construction material, stationary
Brooms, contractors rotary
Buggies and carts, concrete hand operated
Buggies and carts, concrete power propelled
Chutes, concrete handling
Concrete surfacing machines
Discs, road, harrow type for construction work
Discs, road, wheel mounted type
Distributors, water (street sprinklers)
Ditchers, blade
Dredges and dredge equipment, except mining
Drilling machines, portable water well, churn drill type
Earth boring machines, vertical sugar type
Finegraders and subgraders, self-propelled type
Finishers and rodding machines for wet concrete
Forms, concrete road
Graders, blade or pull type earth moving
Graders, self-propelled earth moving
Hoists, contractor and material handling exceeding 6,000 pounds line pull at 250 FPM line speed or exceeding 1,300,000 foot pounds effort based on second wrap of cable
Hoppers, portable concrete
Maintainers, road
Maintainers, shoulder
Plows, cable laying
Plows, snow (V and blade types—truck, tractor, grader or railroad mounted, including wings)
Rollers, road portable
Rollers, road pneumatic tired
Rollers, road tandem
Rollers, road three wheeled
Rollers, tamping and sheepfoot
Scarifiers—complete machines not attachments
Screening plants, portable type
Sweepers, street
Sweepers, street motor pick-up
Towers, concrete placing
Towers, material elevating
Washing and screening plants, portable type

SCHEDULE D

The manufacture of items of equipment appearing in Schedule D will be discontinued in accordance with paragraph (e) (2).

Any item to the extent prohibited by any schedule to Limitation Order L-217
Finegraders and subgraders, drawn type
Graders, under truck type
Joint levellers
Scrapers, carrying and hauling, over 15 cu. yd. struck capacity
Scrapers, drag, fresno and rotary, except those under jurisdiction of Limitation Order L-170

CONTROLLED MATERIALS PLAN INFORMATION.— Answers to the most frequently asked questions in connection with the operation of the Controlled Materials Plan have been made available by the War Production Board in booklet form. These questions and answers have been compiled following field surveys by the staff of the Controlled Materials Plan Division, and represent an aid to industry in operating under CMP Regulations as they stand to-day.

The questions and answers fall into five classes, involving general aspects of the plan; allotments and preference ratings; inventory and inventory adjustments; maintenance, repair, and operating supplies procedure; and the transition from PRP to CMP.

Copies of the booklet, entitled Questions and Answers Regarding Operation under the Controlled Materials Plan, can be obtained from the Education and Inquiry Branch, Controlled Materials Plan Division, War Production Board, Washington, D. C.

LABOR-SHORTAGE AREAS— Six of the seven industrial communities recently placed in the list of labor shortage areas have been added by the Regional Directors of the War Manpower Commission to the thirty-two where the President's Order calling for a 48-hour week is in effect, Chairman Paul V. McNutt announced March 29.

The newly designated communities are Burlington and Wilmington, North Carolina; Evansville, Indiana; Tampa, Florida; Savannah, Georgia; and that part of the area south of Chicago including the Calumet District, Lake and Porter Counties, and the southern part of Cook County.

In the latest listing of areas according to labor adequacy, Akron, Ohio, Bath, Maine, and Portsmouth, New Hampshire, were shifted from the shortage list to the group of areas in which there is a present balance of labor supply and demand. The 48-hour order, however, will continue in effect in these three areas.

Chairman McNutt in issuing the regulations governing the application of the minimum wartime work-week order designated the 32 shortage areas[1] in which it would become effective first. It was explained, however, that in the future the Regional Manpower Directors would have the responsibility of designating other areas coming under the 48-hour week. It was emphasized that the selection of areas for application of the work week order is not determined entirely by the labor market classification. Regional Manpower Directors take into consideration factors other than labor scarcity, Mr. McNutt said.

PRICE ADJUSTMENTS ON CONSTRUCTION MATERIALS—To meet problems created by acute local shortages in regionally produced building materials, the Office of Price Administration on March 27 revised the methods by which manufacturers of these materials may apply for adjustment of maximum prices. This action authorizes regional administrators of OPA to provide individual adjustments of maximum prices for manufacturers in cases where certain wartime shortage factors exist, outlined as follows:

1. Where a shortage exists in a locality or threatens to exist, with respect to a particular commodity which aids directly in the war program or is essential to a standard of living consistent with the prosecution of the war;

2. Where the shortage will be reduced or eliminated by adjusting the manufacturer's maximum prices;

3. Where the adjustment will not create or tend to create a shortage or a need for an increase in prices in another locality.

The standards set for regional administrators and manufacturers are contained in Amendment No. 9 to Maximum Price Regulation No. 188 (Manufacturers' Maximum Prices for Specified Building Materials and Consumers' Goods other than Apparel), effective April 2, 1943. The action, in effect, conforms to previous OPA action originally contained in Amendment No. 33 of the General Maximum Price Regulation.

The order follows:

(Document No. 13001)

[MPR 188,[2] Amendment 9]

MANUFACTURERS' MAXIMUM PRICES FOR SPECIFIED BUILDING MATERIALS AND CONSUMERS' GOODS OTHER THAN APPAREL

A statement of the considerations involved in the issuance of this amendment has been issued simultaneously herewith and filed with the Division of the Federal Register.[3]

Section 1499.161 is amended and a new § 1499.167 is added, both as set forth below:

§ 1499.161 *Applicants for adjustment and petitions for amendment*—(a) *Applications for adjustment.* The Office of Price Administration, or any duly authorized officer thereof, may by order adjust any maximum price established under this Maximum Price Regulation No. 188 in the following cases:

(1) In the case of a manufacturer who shows:

(i) That such maximum price causes him substantial hardship and is abnormally low in relation to the maximum prices established for competitive sellers of the same or similar commodities; and

(ii) That establishing for him a maximum price bearing a normal relation to the maximum prices established for competitive sellers of the same or similar commodities will not cause or threaten to cause an increase in the level of retail prices.

Applications for adjustment under this paragraph (1) shall be filed in accordance with Revised Procedural Regulation No. 1.[4] No application for adjustment filed after November 15, 1942, will be granted under this paragraph (1).

(2) In the case of any manufacturer, when it appears with respect to an article set forth in Appendix B (§ 1499.167) of this Maximum Price Regulation No. 188:

(i) That there exists or threatens to exist in a particular locality a shortage in the supply of a commodity which aids directly in the war program or is essential to a standard of living consistent with the prosecution of the war; and

(ii) That such local shortage will be substantially reduced or eliminated by adjusting the maximum prices of such manufacturer and of like manufacturers for such commodity; and

(iii) That such adjustment will not create or tend to create a shortage, or need for increase in price, in another locality, and will effectuate the purposes of the Emergency Price Control Act of 1942, as amended.

Each regional administrator is authorized to make adjustmenuts or act upon applications for adjustment under this paragraph (2).

(3) In the case of any manufacturer who shows:

(i) That he is the sole manufacturer of an essential commodity such as one, the production and sale of which is affirmatively permitted by regulations or orders issued by the War Production Board.

(ii) That the maximum prices established by this regulation do not permit the recovery of total costs; and

(iii) That the operations of the company are currently being conducted at a loss.

Adjustment in price may be made to an extent sufficient to enable the manufacturer to recover total costs on the article, together with a profit. In a proper case, the manufacturer may charge a price equal to the price requested in the application, provided that he has received a letter from the Office of Price Administration stating that his is a proper case. Such price shall be tentative and refunds shall be made to each purchaser in the event that the application is denied in whole or in part. Applications for adjustment under this paragraph shall be filed in accordance with Revised Procedural Regulation No. 1.

(b) *Petitions for amendment.* Any person seeking an amendment of any provision of this Maximum Price Regulation No. 188 may file a petition for amendment in accordance with the provisions of Revised Procedural Regulation No. 1.

§ 1499.167. *Appendix B.* The maximum prices for articles set forth below may be adjusted in accordance with provisions of § 1499.161 (a) (2) of this Maximum Price Regulation No. 188.

NOTE: The articles listed below are not intended to include (a) any commodity subject to a specific maximum price regulation or price schedule in effect on August 1, 1942, or issued any time thereafter, or (b) any commodity exempted from the General Maximum Price Regulation by any supplementary regulation thereto, in effect on August 1, 1942, or issued any time thereafter. Since the designations of some articles are broad enough in certain instances to suggest that articles are included which are intended to be excluded, other regulations which might be applicable to the article or type of article have been indicated. Manufacturers selling articles listed below should, before seeking an adjustment of their maximum prices in accordance with this

[1] See *48-Hour Week Ordered* in PIT AND QUARRY, March 1943, pages 55-56.—ED.]

[2] 7 F.R. 5872, 7967, 8943, 8948, 10155; 8 F.R. 537, 1815, 1980, 3105.

[3] Copies may be obtained from the Office of Price Administration.

[4] 7 F.R. 8961.

regulation, determine whether specific price regulations or regulations supplementary to the General Maximum Price Regulation have been issued subsequent to the date of this regulation with respect to the articles so listed.

Concrete products:
- Building blocks and bricks
- Tile and tiling
- Sewer and culvert pipe
- Drain tile
- Posts, piles, and cribbing
- Septic tanks
- Grave vaults and liners
- Laundry trays

Structural clay products:
- Common brick
- Sand-lime brick
- Hollow tile, unglazed

Clay drain tile
Sand and gravel
Slag
Cinders
Crushed stone:
- Construction
- Metallurgical
- Chemical

Ready-mixed concrete
Rough stone:
- Rubble
- Riprap
- Field stone

Dimension stone:
- Limestone
- Granite
- Marble
- Sandstone
- Basalt and related rocks

This amendment shall become effective April 2, 1943.

(Pub. Laws 421 and 729, 77th Cong.; E.O. 9250, 7 F.R. 7871)

Issued this 27th day of March, 1943.

PRENTISS M. BROWN,
Administrator.

SAFETY SHOES.—For the convenience of workers who need to buy "safety" shoes on short notice the Office of Price Administration will authorize employers, beginning April 5, to issue purchase certificates for safety shoes to any employee who has spent his ration stamp 17.

Under the new system any employer whose plant is not served by a Plant Area Rationing Board may designate a company representative to whom workers can apply for certificates. Local War Price and Rationing Boards will, of course, continue to act on individual applications if employers do not wish to make use of the new plan. The worker must fill out the regular OPA application form. If the application shows the safety shoes are needed and the worker does not have a Stamp 17, the company representative issues a certificate authorizing their purchase.

These certificates will be issued only after a worker has spent his own Stamp 17—the shoe stamp in War Ration Book One. He is not required, however, to use unspent stamps held by others in his family to qualify for a certificate for safety shoes.

To get a supply of certificates for issuance to workers, the employer applies to the OPA district office serving his area. He states the total number of employees wearing safety shoes, any anticipated change in this number, the average wearing period of the shoes, an estimate of the number of pairs bought by employees in the preceding two months, and information about the jobs on which the shoes are needed. At the same time he submits for District OPA Office approval the name of the representative he is appointing to issue certificates.

On approval of the application, the District Office may give the establishment enough certificates to take care of its workers' needs for two months.

When the initial supply of certificates runs low, the employer can secure more by writing to the District Office, stating the number he has on hand, and sending for review the applications against which the company representative has issued certificates.

The new provisions, which apply only to safety shoes, are contained in Amendment No. 7 to Ration Order 17, effective April 5.

TIRES FOR TRUCKS.—In applying to local War Price and Rationing Boards for tires, tubes, and recapping service, fleet owners should bear in mind that they need not present the unit Certificate of War Necessity covering the vehicle to be serviced, the Office of Defense Transportation announced March 31. The master CWN covering the fleet is sufficient, provided the owner certifies on the application form that he holds a unit certificate for the vehicle to be serviced and that he has complied with the tire inspection requirements of the Office of Defense Transportation. If, in applying for tires, tubes, or recaps, a fleet owner presents a valid unit certificate, he should have it returned to him immediately after the ration board has noted its presentation on the application form since the ODT requires the unit certificate to be on the vehicle while in operation.

TRANSPORTATION TAX RULING.—In a letter written by D. S. Bliss, Deputy Commissioner of Internal Revenue, to Hayes & Hayes, tax counsel for the National Sand & Gravel Association, he states that it is the policy of the bureau to regard amounts paid for the use of trucks *and* drivers as being amounts paid for the transportation of property for hire and, therefore, subject to the 3-per cent. tax under the provisions of Section 3475 of the Internal Revenue Code, as added by Section 620 of the Revenue Act of 1942. On March 9, Hayes & Hayes, acting for the National Ready Mixed Concrete Association, asked the Internal Revenue Bureau to clarify official policy.

Where the driver does not go along with the truck, and where the rented truck is operated by the lessee or an employee of the lessee, the amount paid to the lessor for the rental of the truck is not regarded as an amount paid for the transportation of property for hire and, therefore, the 3-per cent. tax would not apply. This interpretation is in harmony with the position taken by the bureau in an earlier letter, according to V. P. Ahearn, the association's executive secretary.

It is the policy of the bureau to regard the 3-per cent. tax as payable when there is no employer-employee relation between the lessee or owner of the truck and the driver of the truck for federal employment-tax purposes. If the driver of a truck used in this industry is made the subject of federal employment-tax deductions by the owner or lessee of the truck, the 3-per cent. tax is not required to be paid. If a producer places the driver of the truck on his payroll, even if only temporarily, transportation of property for hire does not occur, within the meaning of Section 3475 of the Internal Revenue Code.

UP-RATING ORDERS BY ALLOTMENT NUMBERS.—An interpretation of CMP Regulation No. 3, announced by the War Production Board on April 3, makes clear that the up-rating of an order by the application of an allotment number relates back, for the purpose of determining the sequence of delivery, to the date on which the original rating was applied to the order.

The interpretation points out that the re-rating accomplished by the application of an allotment number is governed by the re-rating procedures established in Priorities Regulation No. 12. This means that the sequence of deliveries is to be determined as if a rated order, to which an allotment number is applied, actually bore the allotment number at the time it was first placed.

The interpretation covers only the use of allotment numbers as a re-rating device and does not cover the placement of authorized controlled-material orders, which is governed by CMP Regulation No. 1.

Persons having orders which are uprated by the use of allotment numbers must make any necessary adjustments in production and delivery schedules promptly upon receipt of the allotment numbers. However, no producer will be required to terminate or interrupt a production schedule within 40 days after receipt of the re-rating in any case where the termination or interruption would result in a substantial loss of production. Producers are also prohibited from diverting materials, specifically produced for orders bearing preference ratings higher than A-2, and delivering them under higher rated orders if such materials are completed at the time the allotment number is received, or are scheduled for completion 15 days after the allotment number is received, unless specifically directed by WPB to do so or unless the material is to go into production of emergency items.

WAR LABOR BOARD REGIONAL OFFICES.—Applications for approval of voluntary wage and salary increases under the wage-stabilization orders must be filed with the regional offices of the National War Labor Board. The offices so far established are listed below.

REGIONAL WAR LABOR BOARD OFFICES

Region 1—Maine, Massachusetts, New Hampshire, Rhode Island, Vermont—
Saul Wallen, regional chairman,
209 Washington St., Boston, Mass.

Region 2—New York, and northern counties of New Jersey—
Theodore Kheel, regional chairman,
220 East 42nd St., New York City.

Region 3—Delaware, District of Columbia, Maryland, Pennsylvania, and southern counties of New Jersey—
Sylvester Garrett, regional chairman,
21 S. 12th St., Philadelphia, Pa.

Region 4—Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, Virginia—
M. T. Van Hecke, regional chairman,
116 Candler Bldg., Atlanta, Ga.

Region 5—Kentucky, Ohio, West Virginia—
Lewis Gill, regional chairman,
629 Euclid Ave., Cleveland, Ohio.

Region 6—Illinois, Indiana, Minnesota, North Dakota, South Dakota, Wisconsin—
Robert K. Burns, regional chairman,
222 West Adams St., Chicago, Ill.

Region 7—Arkansas, Iowa, Kansas, Missouri, Nebraska—
Joseph A. Hoskins, regional chairman,
911 Walnut St., Kansas City, Mo.

Region 8—Louisina, Oklahoma, Texas—
Floyd McGown, regional chairman,
New Mercantile Bank Bldg., Dallas, Tex.

Region 9—Colorado, Idaho, Montana, New Mexico, Utah, Wyoming—
Charles Graham, regional chairman,
306 Midland Savings Bank Bldg., Denver, Colo.

Region 10—Arizona, California, Nevada—
Thomas Fair Neblett, regional chairman,
1355 Market St., San Francisco, Calif.

Region 11—Michigan—
Edwin E. Witte, regional chairman,
Penobscot Bldg., Detroit, Mich.

Region 12—Oregon, Washington—
G. Bernard Noble, regional chairman,
1411 Fourth Ave. Bldg., Seattle, Wash.

EDITORIAL

On "Holding the Line"

COMING on top of the original wage-stabilization order freezing salaries and wages, the President's "hold-the-line" policy announced April 8 has stirred up a storm of protest that grows from day to day. This opposition has found its most dangerous expression in the strike of the coal miners, who have been seeking a $2-a-day increase in their wages to meet the continually rising cost of living, and there is good reason for believing that it will spread to other fields despite the taking over of the coal mines by the government. The discontent among workers arises from the fact that the "hold-the-line" policy is being applied only to their incomes and not to their necessary living expenses, which results in squeezing them between a floor that is constantly rising and a ceiling that is immovable. A situation from which there appears to be no escape is not likely to be borne with equanimity.

Persons in the salary brackets above the $5,000-a-year level are not ordinarily concerned with or interested in changes in the cost of living, and even now, when such salaries are frozen at their old figures, the subject is felt to be of only theoretical importance. People whose expenditures lie chiefly in the luxury fields, because of the wide margin between their incomes and their necessary costs of living, do not suffer distress when those costs rise 10, 25 or even 50 per cent. The increases are met by shrinking those luxury outlets —such as clubs, concerts, sports, social prestige, college educations, second cars, patronage of the arts, etc.— which absorb so large a portion of those higher incomes. Pride suffers, of course, but pride of that kind is itself a luxury.

But to persons of small incomes—the wage and salary workers who still constitute the great majority of our people—a "trivial" increase in the cost of the necessaries of life means the difference between health and sickness, between adequate food intake and malnutrition, between contentment and resentment. To the great majority it means, in addition to these physical and psychological factors, reduced working morale and reduced output caused by lassitude, vitamin deficiency and justifiable absenteeism.

Under existing regulations the War Labor Board does not approve salary or wage increases that exceed the arbitrary 15-per cent. cost-of-living increase set up as the foundation for the "little steel" formula. Every week dozens of the board's decisions in cases involving requests for approval to raise wages and salaries cross our desk and in the great majority of these cases the answer is a refusal. For example, in the case of a $24-a-week clerk, who had been granted a $1 increase January 1, 1941 and nothing since, her employer was recently refused permission to raise her salary to $27, a total increase of only 12½ per cent. during a period of 26 months in which the cost of food alone had risen by several times that percentage.

We hear much about price control and its supposed effects in preventing price increases, but one must be indeed naive or unobserving not to know that price ceilings, where they have been established, have been violated in effect by the lowering of quality, the decreasing of quantity, or both. Whatever food one buys to-day, he pays more for it than he did two years ago in spite of the price controls which are "in effect" but ineffective. Compare the following prices of ordinary everyday food in one of the strike-bound coal towns in Pennsylvania—not the swanky suburbs of New York or Chicago with which some of us may be more familiar. In January 1941 leg of pork was 25 cents a pound, in February of this year it was 39 cents a pound; lamb shoulder, which was 22 cents, rose to 39 cents; bacon went from 18 to 39 cents, spinach from 5 to 10 cents, butter from 35 to 57 cents, oranges from 25 to 59 cents a dozen. Also, in the field of apparel needed for work in the same town—which, by the way, is not greatly different from other towns in the matter of cost-of-living items—knee and rubber boots, which were $4.50 a pair, rose to $5.25, work shoes, that were $2.95, rose to $4.95. In a city nearer home radishes that cost 5 cents for two bunches sell at 25 cents, cabbage that sold for 5 cents a pound sells for 20 cents. These are typical of the great majority of the foods which sustain life among the working population. These—and not fresh shrimps, breast of guinea-hen, endive nor Charlotte Russe—are the foods that produce the munitions of war; they are the types of foods that, along with necessary clothing and shelter, absorb the entire incomes of many workers and constitute more than 95 per cent. of the total living expenses of the great majority of them.

WE believe that a rigid control of the cost of living, of which the cost of labor forms a large part, is essential if we are to avoid the dangers of inflation. But we can not see the wisdom, to say nothing of the justice, of freezing incomes without freezing expenses at comparable levels. If the two can not be controlled at the same time—that is to say, if price regulation and income regulation can not be applied at the same moment, and if the two can not be enforced with equal effectiveness in all cases—then the freezing of incomes should follow the freezing of prices. Wages and salaries, in our judgment, should not be placed under ceilings until after commodity prices have been stabilized and until after those incomes have been able to catch up with the cost-of-living increases that have already occurred and are occurring every day. To stabilize the one without, at the same time and at a just ratio, stabilizing the other is to impose an unfair burden on those whose lives are adversely affected and does more to impair the morale of our people than all the Axis propaganda released over the radio and by word of mouth. The large number of infractions of the regulations occurring daily throughout the country, in spite of the severe penalties that threaten, is sufficient evidence of the widespread lack of belief in the wisdom and fairness of the rules.

Flotation Plant in Florida Recovers Phosphate from Accumulated Tailings

another ON THE SPOT report

THE Phosphate Mining Company was organized in 1905 as a producer of phosphate rock from the land-pebble phosphate field of Florida and has been one of the leading producers and processors of pebble phosphate since that time. In addition to being among the foremost companies in the field in the development and application of new and improved techniques, the company is also unusual in that it carries processing through to the finished chemical products. A *resumé* of the various plants operated by the company, and the methods used, would be, in effect, a history of the industry and its technology.

● This article describes a new froth-flotation and table-concentration plant being operated by a leading Florida pebble-phosphate producer. The plant recovers phosphate from millions of tons of debris which had been wasted by one of its washing plants since it was built in 1929. A drying plant makes this a complete phosphate-recovery and processing operation at one location.

Among the company's latest rock-producing operations is a new flotation plant at Phosmico, five miles northeast of Bartow, Florida. This plant went into full operation in January, 1941, operating in conjunction with, although independent of, the No. 91 mining-and-washing operation and the No. 91 drying and wet-storage operations. Together these plants make a complete phosphate recovery and processing unit in one field location. The new flotation plant has a capacity of 15,000 tons per month of flotation concentrates.

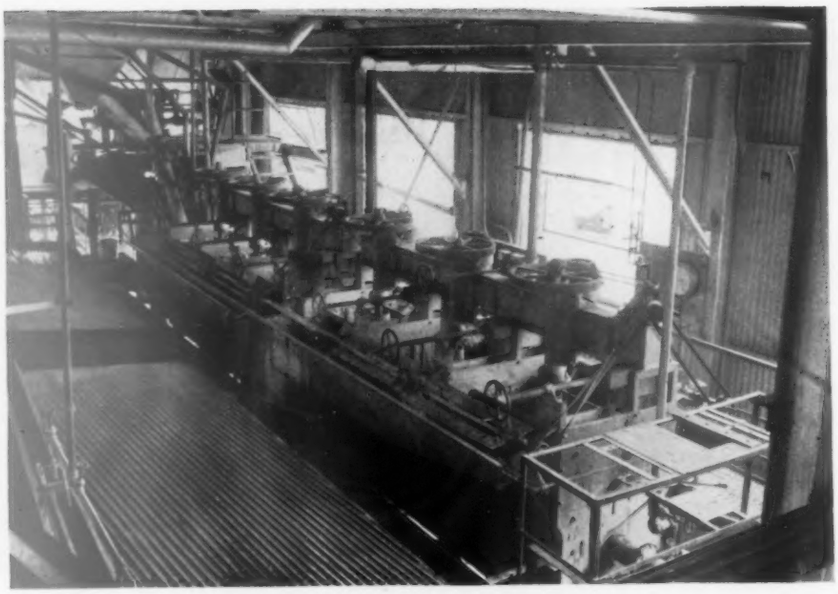
The original operations of the company centered around the company village of Nichols. As mining areas adjacent to Nichols became mined out, field operations were forced farther and farther away, but Nichols continued to be the center of operations. In 1925 a calcining unit was added to the company activities; this consists of an 8- by 110-foot rotary kiln for the removal of carbon dioxide and organic material from the phosphate rock. In 1940 wet-phosphoric-acid and contact-sulphuric-acid plants were built at Nichols and these have since been expanded. In 1938 an electric furnace for the production of elemental phosphorus was built and put in operation. Facilities have been added for grinding phosphate for use in the above-named company-owned plants and for sale to fertilizer and chemical plants. Among the special chemical products made are phosphorus, technical and food grades of phosphoric acid, superphosphate and triple superphosphate.

General view of the washing plant. Hydroseparator for concentrating plant at right.

The Nichols operations now receive all the rock from the company's No. 43 mine and washer south of Mulberry as well as part of that from the No. 91 washer and flotation plant at Phosmico. The Phosmico deposit is nearing depletion and plans are being developed for opening a virgin deposit near Homeland, Florida.

The mining ground included in the Phosmico deposit is one of the few sources of high-grade pebble phosphate remaining unmined in this area. In general, the overburden ranges in depth from a minimum of 3 feet to a maximum of approximately 30 feet. The phosphate bed or matrix varies from a minimum of 5 feet to a maximum of 15 feet in thickness. Both the

Hydraulic dredge which reclaims debris from pond for concentrating plant.



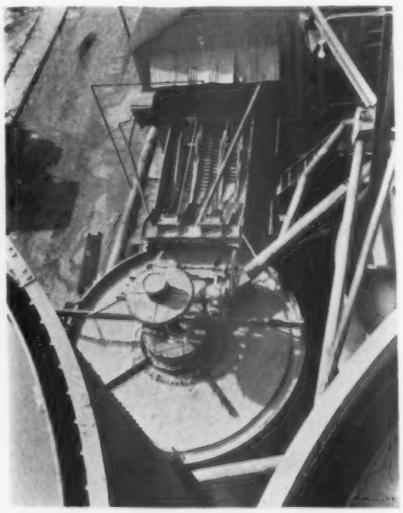
The six rougher and cleaner cells in the concentrating plant.

overburden and the phosphate matrix are handled by a Bucyrus-Monighan electric walking dragline with a 125-foot boom and an 8-cubic yard Desota Foundry, Inc., Hendrix light-weight bucket. The dragline operates in the usual manner of digging the overburden and casting into the worked-out section of the pit. After the overburden has been stripped off the matrix is mined with the same dragline. The dragline digs the matrix bank down to bed rock and dumps the material into a pump sump or well, which is on unmined ground along the side of the cut. In this way the pipe-laying, car-moving, and incidental operations necessary in mining are done on the surface instead of in the bottom of the pit as was formerly the case. The phosphate matrix dumped by the dragline is sluiced into the pump sump or well by hydraulic guns in much the same manner as that employed in hydraulic mining. A 12-inch Georgia Iron Works pit pump is used to transport the material to the washer hydraulically. Sometimes one or more booster or lift pumps are used in the transportation line depending on the distance the material must be pumped to the washer. Although this method of handling the matrix is now quite general in the field, this company originally developed the method and was the first in the field to make it standard practice. The mining cuts are in parallel rows 180 feet wide, as is customary in the field. A Cletrac tractor with a winch-and-boom attachment is used for handling and laying pipe, placing guns, etc. The pit car or pump is moved by means of the dragline.

At the washer the matrix is discharged from the pipe line over flat screens. The flat-screen "throughs" go directly to washer *débris,* their plus material goes to rotary submerged screens. Mud balls, etc., go to a disintegrator developed and patented by the company and the comminuted material is returned to the washer circuit. Small clay nodules remaining in the circuit are scrubbed out in rotary scrubbers.

The washer rock is split into plus-⅜-inch coarse rock and minus-⅜-inch plus-18-mesh fine rock.

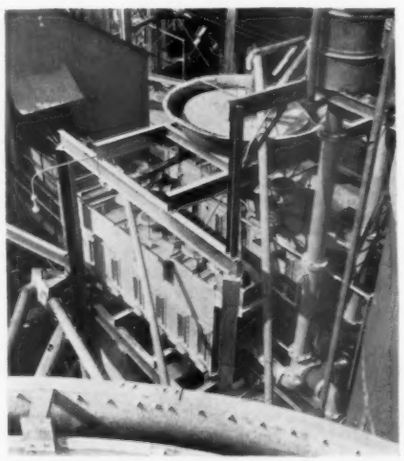
The plus-⅜-inch coarse rock is loaded direct into wet cars and is shipped to Nichols for storage, drying, grinding, etc. The minus-⅜-inch plus-18-mesh fine rock is discharged on a wet pile, from which it is distributed, by grade, to a 60-000-ton pebble-rock storage to be reclaimed as required by a 1½-cubic yard Sauerman drag scraper. This rock is the high-grade source of supply for the company and is usually dried at Phosmico and shipped direct to customers. Occasionally, and to fill specific needs, some of this rock is shipped to Nichols.



Looking down on the 16-foot bowl classifier and its dual rakes which prepare material for flotation.

The drying at Phosmico is done in a 6- by 50-foot rotary drier equipped with automatic pre-heat and pressure control. Several years ago a Buell dust-collector was installed to reduce dust losses occasioned by heavy drying of the concentrates. The material salvaged by the dust-collector is returned through a screw-conveyor to the mill-discharge material. One large and two smaller cylindrical steel bins are used for the storage of dry rock and concentrate before shipment.

Before this flotation plant was built in 1941 the minus-18-mesh material from the No. 91 washer was wasted. Depending on the mining area from which it originated, this material has a BPL content of from 25 to 45 per cent. Fortunately much of the washer *débris* so wasted was discharged into open pits from which both the overburden and the matrix had been removed hydraulically. The slimes were drained from the pits through settling areas, leaving a partially deslimed flotation feed uncontaminated with overburden material.



View showing the two 6-pocket sizers with distributing cone above.

The partially deslimed washer *débris* was originally recovered from the *débris* dams and pits by hydraulic mining of the bank. This practice was discontinued in October, 1941 and was replaced by a floating hydraulic dredge. This has a 21- by 60-foot steel hull and a steel A-frame with a 20-foot suction nozzle and a rotary cutter-head. A 3-drum hoist operates the nozzle ladder and

two shore swing lines. Two 8- by 12-inch spuds on the rear corners of the dredge are operated by individual 2-horsepower motors. In addition to the rotary cutter head, a 1¼-inch jet supplying water under 75 pounds pressure aids in breaking up the material.

The dredge pump is a regular 12-inch Georgia Iron Works pump with a 12-inch suction and a 12-inch discharge. The discharge line, equipped with numerous dredge sleeves for flexibility, is supported between the dredge and the shore on steel-drum pontoons and discharges into a trommel screen located on the top

Another view of the hydroseparator with one of the pumps handling flotation products below.

of the feed bins at the flotation plant. One-quarter-inch screen cloth on the trommels removes the mud balls and oversize material from the flotation-plant feed. The oversize material is flumed back to a mined-out portion of the dredging area.

The material passing through the trommel screen goes to three 22-foot-diameter feed bins equipped with inside overflow launders for the primary desliming and storage of the flotation-plant feed. The plant feed is taken from the bottom of the feed tank and pumped to a small desliming and dewatering cone ahead of two Fahrenwald 6-pocket sizers. The feed-bin overflow is returned by gravity to the dredge area. The cone overflow is returned to the dredge area along with the feed-bin overflow or is sent to a bowl classifier to save the fine phosphate particles which it might contain.

The underflow from pockets 1 and 2 of the sizer goes to a Ferraris screen equipped with 18-mesh slotted wire cloth. The plus-18-mesh product is loaded into cars and is shipped to Nichols for processing, for use in the acid plant, etc. The minus-18-

The dust-collector which is connected to the drier. Note bin-level indicator above screw-conveyor.

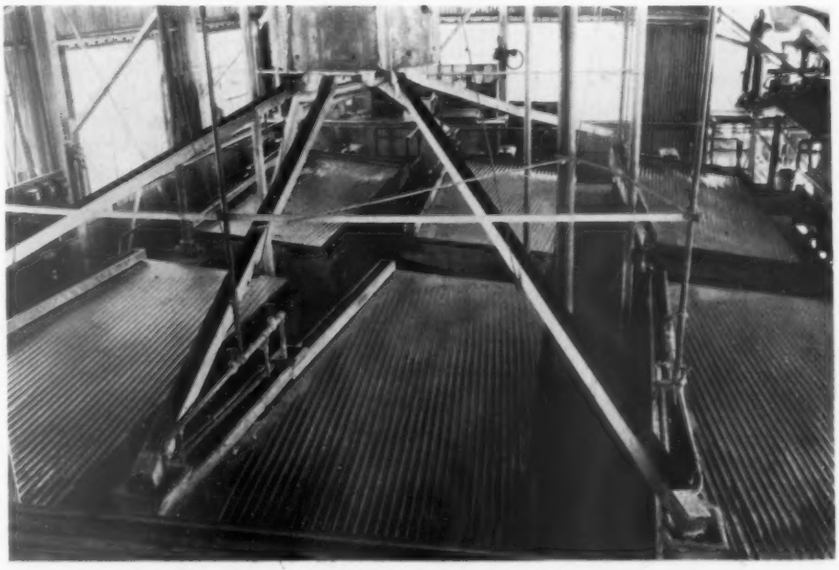
mesh material is returned to the feed-pump sump.

Pockets 3, 4 and 5 of the sizers are operated so as to produce a table-feed product minus 18-mesh and plus 35-mesh in size. This material goes to a 50-ton surge bin and is then pumped to a 4-foot Dorr simplex rake classifier. The rake product of the simplex classifier goes to a 30-inch by 17-foot revolving drum-type mixer. The usual reagents for anionic flotation, consisting of caustic soda, fuel oil and a fatty acid are added for mixing and conditioning with the feed. The mixer discharges into a Denver pulp distributor which distributes the feed equally to six concentrating tables. The six tables make a finished concentrate, a final tailing, and a middling product which is given further treatment.

The product of the sixth pocket of each of the two Fahrenwald sizers together with the sizer overflow goes to a 16-foot Dorr bowl classifier with an 8-foot duplex rake. The bowl overflow flows by gravity to the tailing pump and is pumped into the flotation settling and recirculation system. The classifier sands discharge into two vertical, impeller-type mixers. The reagents, consisting of caustic, fuel oil, and a fatty acid, are added to the feed as it enters the first conditioner. The second conditioner discharges into the number one of four No. 24 Denver Sub A rougher machines. The four rougher cells are followed by two cleaner cells of the same size. The four rougher machines make a rougher concentrate and a final tailing. The rougher concentrate is cleaned in the two cleaner cells which make a finished concentrate and a middling product.

The cell middling joins the table middling and is pumped to a Dorr hydroseparator. The overflow water from the hydroseparator returns to the mill-water circuit for reuse. The underflow of the hydroseparator is discharged into a mixing screw-conveyor. Additional flotation reagents are added at the head of the mixing screw and become conditioned as the material moves through the screw and is discharged into the second pulp distributor. Here the feed is distributed equally to three middling tables. These tables make a finished concentrate, a final tailing and a middling product which is in closed circuit with the middling tables.

The finished concentrate from the cells, the primary tables, and the middling tables is pumped to one of



Six diagonal-deck concentrating tables with distributor above.

Pump feeding debris from washer to concentrating-plant pit.

two cylindrical steel bins equipped with dewatering panels. The drainage water from the dewatering panels returns to the mill-water circuit and is reused. After drainage the concentrate, containing 12 to 18 per cent. moisture, is loaded out by means of a drag-chain conveyor. The drag-chain conveyor discharges on one of two belt-conveyors. The first belt-conveyor loads the material directly into wet-rock cars for shipment to Nichols and further processing; the second belt-conveyor discharges on a storage pile. A 1½-cubic yard Sauerman drag-scraper system distributes the concentrates, according to grade, on a 150,000-ton wet-storage area. The concentrate is reclaimed from storage and dried at Phosmico or shipped to Nichols as needed.

The flotation tailings are pumped to a settling area and the clear water is reclaimed for use in the flotation plant. The use of reclaimed water from the circulation system is beneficial to the flotation-plant operation and reduces the pounds-per-ton-of-reagent consumption materially. A deep well supplies make-up water as required.

Electric-powered drag-line and 8-cubic yard bucket removing overburden from the deposit.

The company-owned town of Nichols is a modern village with a population of 650. Among the conveniences provided are public schools, churches, a library, a golf course, tennis courts, play grounds, a company-owned store, etc. In addition to the Florida office of the company there are a complete analytical and research laboratory and service and repair shops for both the mining operations and the chemical plants.

The Phosphate Mining Company operates a steam power-plant which supplies electricity for the village and plants at Nichols as well as nearly all the power used at the mines at Phosmico and at No. 43, south of Mulberry. A total of 22 miles of 33,000-volt transmission lines is maintained. The company also owns and maintains the railroad between Nichols and the No. 43 mine.

Tractor equipped with winch and boom laying pipe-line between pit and plant.

The main office of the Phosphate Mining Company is at 110 William Street, New York City. The company officers are: J. Treadwell Bullwinkel, president; T. M. Peters, vice-president; H. L. Jersey, secretary; C. E. Heinrichs, treasurer; H. E. Sutton, comptroller. L. W. Harris is assistant comptroller and heads the staff at Nichols.

Plan Post-War Program of Road, Airport Work

A road-building program totaling $3,000,000,000 annually will be an essential part of this nation's post-war economy, according to a study completed by Charles M. Upham, engineer - director, American Road Builders Association, and Daniel R. Lamson, research engineer for the association. This should be supplemented by an airport and public-works program totaling $2,000,000,000, according to this study, thus giving a total public-construction program of $5,000,000,000.

The A.R.B.A. study is based on the assumption that a sound national economy in the postwar period will call for an annual national income of at least $100,000,000,000. On the basis of past experience, from 12 to 15 per cent. of the national income has been invested in construction in prosperous periods. The study estimates that a total expenditure of $15,200,000,000 would be divided as follows: residential building (private $5,200,000,000; industrial and public utilities (private), $2,000,000,000; other private construction, $3,000,000,000; highways, $3,000,000,000; other public construction, $2,000,000,000.

Stimulated by considerable activity in airport runways and aprons, the volume of concrete pavement rose nearly 60 per cent. in 1942, from 84,000,000 square yards in 1941 to 134,000,000 square yards in 1942, according to the Portland Cement Association. Though concrete-highway work fell from 34,000,000 square yards in 1941 to 23,000,000 in 1942, and street and alley paving decreased some 2,000,000 square yards, the increase in airport paving in the same period, from 30,000,000 to over 92,000,000 square yards, brought the total to 133,896,550 square yards for 1942.

That activity in concrete airport pavement is continuing is indicated by comparing the 2,489,767 square yards for January, 1942, with the 5,065,170 square yards laid in January, 1943.

Sufficient Bauxite for War Needs Available

Pointing out that the supply of native high-grade bauxite for aluminum in the United States is limited, Dr. R. S. Dean, assistant director of the Bureau of Mines, reported at the annual meeting of the American Institute of Mining and Metallurgical Engineers at New York City in February that the bureau has formulated a master plan whereby sufficient amounts of this vital war metal can be obtained through utilization of domestic clays, alunite, second-grade bauxite and other alumina-bearing materials.

Speaking before the Nonferrous Metallurgy group of the A. I. M. E., Dr. Dean explained that the bureau's program resulted from pilot plant and laboratory research by its chemists and engineers and from the finding of additional millions of tons of available raw materials by mining engineers of the bureau.

Bureau of Mines Seeking to Make U. S. Independent of Foreign Alumina Ores

● There has been so much ignorance and accidental or willful misrepresentation of the work of the Bureau of Mines in attempting to find new sources of alumina for our war effort that this official statement, provided by Dr. Sayers, director of the bureau, in response to our invitation, should be read with great interest by members of the nonmetallic-mineral industries. It is the first authoritative explanation of the bureau's program and accomplishments to be released to this field.—Editor.

another P&Q exclusive

COMMON CLAY, a material so plentiful that many persons look upon it as a nuisance, actually is an important war mineral destined to play a leading role in the long-range aluminum program of the Bureau of Mines—a master plan to make this nation independent of foreign sources of alumina-bearing ores and to save men and ships by eliminating costly and dangerous convoy work.

Replete with detail, the bureau's program has been tested carefully in its own laboratories and pilot plants. It calls for an intensive search for all grades of domestic bauxite, the construction of milling plants to provide first-grade alumina concentrates, the use of extensive native reserves of high-alumina clays, alunite and other possible materials for turning out alumina, and additional research by bureau metallurgists, engineers and chemists.

The Department of the Interior believes it is the best and most comprehensive system for producing alumina to feed aluminum-reduction plants so they can reach top speed in making vital airplane metal and maintain steady production levels regardless of submarine warfare and other obstacles.

Millions of tons of available raw materials for the aluminum program already have been charted in the United States through the bureau's exploratory efforts, and the transition of these materials into weapons of war awaits only the "go ahead" signal from other war agencies.

Imported first-grade bauxite now is one of the principal sources of alumina in the United States. It is coming in at the rate of many thousands of tons a month in the holds of ships shuttling between the United States and South America. However, every ton of that bauxite must be protected by convoy. Thus, one phase of the bureau's plan calls for the further exploration of domestic bauxite to find increased reserves of Bayer-grade (first-grade) bauxite needed for existing plants in the United States, for export to Canada to supply Bayer plants there, and for use in abrasives in our war plants. Further exploration of domestic bauxite also is essential to find more reserves of second-grade ore for Bayer plants now in the long process of being converted to use this second-grade material.

Bureau of Mines exploratory crews have been out in the field many months searching for the raw materials of alumina and they have made known more than 112,000 tons of Bayer-grade bauxite and 3,037,000 tons of second-grade bauxite. In addition to charting these two grades of bauxite, the exploratory crews have mapped several million tons of still lower-grade bauxite.

The cost for drilling has been at the rate of 8.6 cents per ton for the first- and second-grade bauxite and discovery has been at an average rate of 25 tons of these two grades of ore per foot of holes drilled. But the bureau forecasts the need for greater reserves of second-grade bauxite and proposes that it be permitted to increase its rate of drilling four times. This should result in the discovery of sufficient reserves of second-grade bauxite at a rate which would allow our untapped reserves to remain virtually constant. In other words, the rate of discovery would keep apace with the rate of ore consumption by the milling plants.

How long this cycle of discovery could be maintained has not been determined. The bureau emphasizes that second-grade bauxite can not be used in existing Bayer plants or for certain abrasive and chemical purposes, and exploration has not indicated that additional reserves of Bayer-grade bauxite are likely to be found. Right now the domestic production of Bayer-grade bauxite is not fulfilling the requirements of treatment plants.

So we have the picture. Unless the bureau's program is put into effect this nation must continue to bring in bauxite over submarine-infested waters from South American countries until Bayer plants can be converted to utilize second-grade bauxite. It should be noted that this "switch-over" of Bayer plants is not a miracle which can be achieved overnight. It will take a long time, probably a year or more. This is an era of high-speed warfare, of lightning-quick thrusts, where even a minute's delay may decide the course of a battle.

In November, 1942, the bureau proposed to bridge this gap by providing first-grade bauxite for existing Bayer plants by milling the several million tons of high-silica domestic bauxite, for which no other use is in sight, to produce 1,800 tons of first-grade bauxite concentrate daily. The bureau's proposal, which forms part of its master plan, calls for the erection of a plant which would utilize idle milling equipment available in a region abounding with low-grade bauxite. The construction of this plant for producing first-grade bauxite concentrate to replace imported bauxite would require only *three* months.

We must realize also that plants now geared to Bayer-grade bauxite are competing with rubber, high-octane gasoline plants, and other important projects for the large amount of steel necessary in converting them to handle the low-grade bauxite. Even when the conversion of Bayer plants is completed, first-grade bauxite for abrasives and chemicals still will be lacking.

If this proposal had been followed, Navy vessels assigned to convoying bauxite now might be serving other important missions where they are vitally needed. If we received the "all clear" right now, we could relieve the Navy of that task in three months.

Unless sufficient high-grade bauxite is imported to serve all the Bayer plants, they must depend largely on the second-grade domestic bauxite, resulting in decreased alumina-pro-

By R. S. DEAN
Assistant Director, Bureau of Mines

ducing capacity and a probable below-schedule output of aluminum for planes. Aluminum-producing plants would operate below capacity and much of the available electrical energy would go unused as far as aluminum production is concerned.

But if the bureau's milling proposal is accepted, we will be able to reach capacity production of aluminum much sooner and we will have a continuing source of high-grade bauxite concentrates for abrasives, for chemicals, and for shipment to Canada. There is another factor that makes the bureau's milling proposal particularly attractive and that is the fact that considerable second-grade bauxite ore now is exposed and ready for mining. But if this lies unused, it will be covered with overburden and the cost of mining it at some future date will be extensive.

However, the bureau realizes that even with all-out exploratory activities for new bauxite, with a milling program using all available equipment, and with the conversion of Bayer plants, we still could not produce sufficient alumina to make this nation secure for a long war. Therefore, other sources of alumina should be exploited and that is where common clay enters.

The construction of commercial plants for the production of alumina from clay is an essential part of the bureau's master plan for aluminum. Already there has been submitted to the WPB a detailed proposal suggesting the construction of the first of such plants to produce alumina from the Hobart Butte clay deposits in Oregon. For this project the bureau proposes the ammonium sulphate process which has been tested and approved in the bureau's pilot plants.

An extensive study of clay deposits of the United States has been conducted by the bureau to ascertain their availability and suitability for the production of alumina by various processes. The Hobart Butte plan is only the first of a series of proposals to be submitted. Recommendations for other plants and other processes to utilize known clay deposits are being formulated. The bureau recognizes the necessity of producing alumina from clay in the Pacific Northwest where so large a portion of the metallic-aluminum reduction plants are located and where power is available from the Grand Coulee and Bonneville dams.

Millions of tons of alunite, another source of alumina, have been explored by the bureau in the vicinity of Marysvale, Utah. A movement was begun to put these reserves to work, and the bureau strongly supported the proposal for the construction of a plant to produce alumina from alunite by the kalunite process. This plant now is nearing completion and soon will be ready to produce alumina. Now the bureau advocates that, in addition to this new plant, the facilities of another plant at Marysvale, Utah, be revamped and put to use in recovering alumina from alunite by another process which has been tested thoroughly in the bureau's pilot plants and laboratories. The known reserves of alunite in the Marysvale district could support the proposed plant for many years.

The bureau's study of the aluminum problem is not "seasonal." It is continuing on many fronts. At Little Rock, Arkansas, a "clearing house" has been established to coordinate and expedite the work of the exploratory crews. Milling processes advocated by the Bureau have been worked out completely on a pilot-plant scale at its Rolla, Missouri, laboratory. Pilot plants at College Park, Maryland, Norris, Tennessee, Tuscaloosa, Alabama, Salt Lake City, Utah, and Seattle, Washington, are working on various metallurgical and milling problems, and an extended program of pilot-plant study of processes for the production of alumina from all types of clays is being carried forward under a special appropriation from the Congress.

New fields constantly are being explored in the long-range plan to make this nation self-sufficient in aluminum. In addition to the bureau's work which has led to the proposed aluminum-production program thus far disclosed, the bureau has studied the soda-lime sinter process for producing alumina from clay, the electric-furnace process for treating high-iron bauxite, and a number of direct acid processes. Whenever technical and economic problems can be solved, a proposal for commercial operation is placed before the WPB.

There is no secret about the bureau's studies and findings. Its work is carried on for the good of this nation and the United Nations, and information on all these processes and tests is made available to interested industrial groups so our fighting forces and our Allies can have sufficient weapons to continue carrying the battle to the enemy.

Part of a fleet of 23 Le Tourneau Carryall scrapers and Caterpillar tractors engaged in extensive stripping operations at Bauxite, Arkansas, preliminary to obtaining raw materials for the production of aluminum, so necessary in the manufacture of war planes and other war equipment. These units have been stripping approximately 1,000,000 cubic yards of overburden a month for the McGeorge Contracting Company which is doing the job for the Aluminum Company of America.

Recover $200,000 Gold at Aggregates Plant

The total amount of placer gold recovered from the aggregate processed for Friant Dam, in California, was valued at about $200,000. From this gross return was deducted the expenses involved in preliminary exploration, cost of the gold-recovery plant and operation which totaled about $24,000. The net proceeds of $176,000 were divided equally among the Bureau of Reclamation and Griffith Company & Bent Company, the contractors.

The aggregate from which the gold was washed came from gravel bars on the San Joaquin River below the dam. Some pockets of gravel produced as high as 18 cents per cubic yard, but the average was about 8½ cents. This phase of the operations was described in the story of the aggregate plant which appeared in the May, 1941, issue of PIT AND QUARRY.

Extraction of placer gold from aggregate is also being carried on by the contractors on Shasta Dam in the Sacramento River below that structure.

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With war demands for increased output, "STURTEVANTS" are taking over the job of lime production in a big way.

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The Rotary Fine Crusher is widely recommended for the reduction of limestone for the cement, lime and sugar industries. Insures an even, granular product with minimum fines. Easily accessible for cleaning, repair or replacements. A large-capacity, non-clog crusher.

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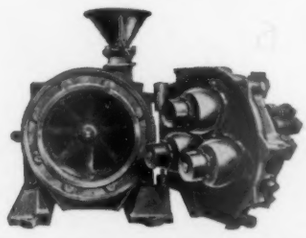
The STURTEVANT Air Separator is capable of classifying dry materials in a range of 40 to 400 mesh. An extremely rugged machine, which operates very efficiently in closed-circuit with the STURTEVANT Ring-Roll Mill in making agstone. This Separator increases mill capacities, and operates with low power requirements. Hundreds of STURTEVANT Separators have been installed in the cement industry alone . . . with no rejections.

RING-ROLL MILLS



The Ring-Roll Mill is tops in efficiency for medium and fine reduction of hard or soft materials. Especially suitable for producing agstone in large volume in conjunction with the STURTEVANT Air Separator or Moto-Vibro Screens. The powerful and positive crushing action economically reduces any kind of rock up to 1½".

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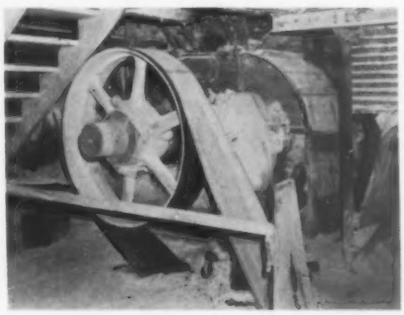
AGRICULTURAL LIMESTONE IN THE CHICAGO AREA

This signboard along the highway near Chicago urges livestock truckers to carry return loads of agricultural limestone. It is lighted at night for 24-hour duty.

another P&Q exclusive

THE crushed-stone plants in the Chicago and metropolitan area were, for the most part, designed primarily to turn out aggregates, ballast and metallurgical stone. By-product fines have been sold to a limited extent for agricultural use but no particular effort had been made to process material for this market. With the growth in demand for liming materials under the A.A.A. soil-conservation program, however, a greater volume of agricultural limestone has come out of the Chicago region in the past few years and producers are now casting a covetous eye on this market and going after it intensively. Farm land throughout the northern part of Illinois and sections of southern Wisconsin and Indiana are receiving the



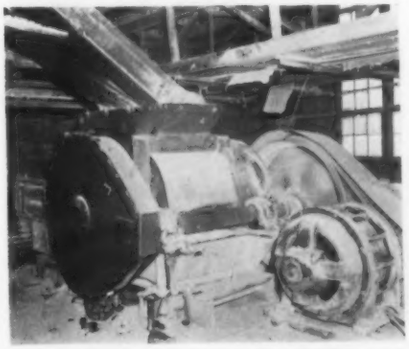
One of the two sets of 24- by 54-inch rolls in the Dolese & Shepard plant.

neutralizing benefit of "made-in-Chicago" agricultural limestone. Shipments are made as far as 200 miles distant by both railroads and motor trucks.

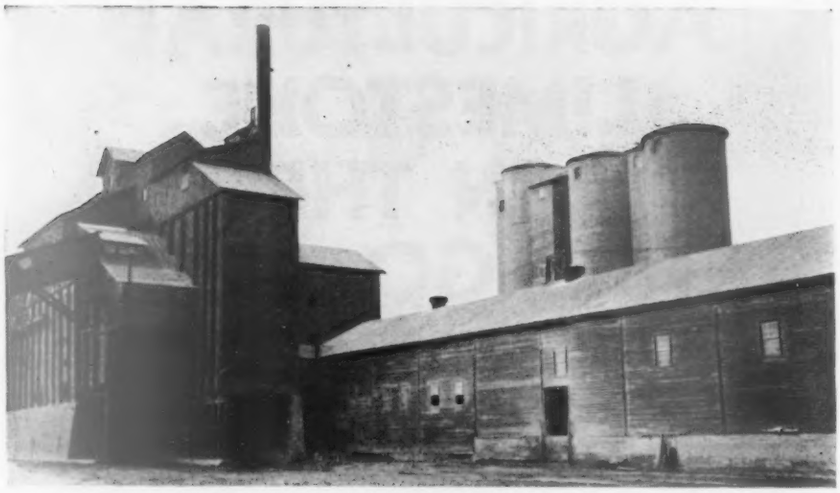
Big producers in Chicago are expecting a sharp decline in the demand for commercial stone by July or August of this year when several large war projects are completed, and a swing to agricultural limestone as the primary product rather than a secondary by-product is well within the realm of probability. Ceiling prices on Chicago-produced limestone, being based on waste-material prices, are at rock-bottom levels and an organized effort is now under way to obtain a rise in these ceilings. Evidence of the extra cost necessary to produce agricultural stone from the larger sizes has been presented to the Office of Price Administration in a preliminary effort to lift the existing ceilings.

General view of the main crushing-and-screening building at the Consumers Company McCook plant.

According to Harry Clark, treasurer of the Midwest Agricultural Limestone Institute, Illinois producers will fall about 1,000,000 tons short of the 3,000,000-ton demand for agricultural limestone in 1943 if present producing facilities are not changed to allow an increase in the production of this material. There was a like situation last year, producers having been able to supply only about 65 per cent. of the demand from farmers. Some of the difficulties encountered last year are even worse this year, such as truck shortages, O.D.T. limitations on trucking distances, labor scarcity, and the inability to obtain repair parts for production equipment. On the other hand, more fines are expected to be available for use on the soil as the war-construction program becomes less demanding. Last year, for example, large tonnages were needed for construction, fill, and yard-surfacing purposes. Many crushed-stone producers had their entire output requisitioned under war-plant contracts, specifications insisting that all natural fines be left in, thus prevent-



The 22- by 40-inch roll crusher in the Dolese & Shepard plant.



Agricultural stone and dust department at the Bellwood plant of the Consumers Company. The concrete silos store three sizes of fine limestone.

ing their use as agricultural limestone.

Contract haulers of livestock are being prevailed upon to carry return loads of agricultural stone under the return-load provisions of O.D.T. regulations. One producer, the Dolese & Shepard Company, whose plant and quarry at McCook, Illinois, are located on U.S. 66, an extension of Ogden Avenue in Chicago, has erected a large signboard along the highway near the plant reminding livestock truckers that their trucks will be loaded quickly and without effort on their part. This plant is stocking the minus-⅛-inch screenings from four Niagara and Robins 4- by 8-foot screens as agricultural stone. It recently installed a Pioneer 22- by 40-inch two-roll crusher to make agricultural stone by re-crushing some of the larger sizes. The stone is withdrawn from bins and carried to the rolls by a belt-conveyor, the product being returned to the bins. A 100-horsepower G.E. motor drives the Pioneer machine through V-belts. Two old Power & Mining Machine Company (now Allis-Chalmers) 24- by 54-inch double-roll crushers are also used for producing fines when needed. About 90 per cent. of this plant's agricultural-limestone output is now made on the rolls.

An interesting and rather elaborate installation is found at the Bellwood plant of the Consumers Company of Illinois, where three distinct grades of agricultural limestone are being produced. These three grades are stored in three concrete storage silos. Screen throughs of minus-16 mesh down to dust are stored in the first silo and are loaded out, largely into trucks, through manually-controlled gates.

The second product, throughs from two 3- by 8-foot Universal vibrating screens which remove ¼-inch and larger chips, is first passed through an Allis-Chalmers 5- by 75-foot rotary drier and then ground in an Allis-Chalmers 6- by 6- foot ball-mill. The resulting product, of which 35 per cent. passes a 200-mesh screen, is stored in the second silo and some of it is bagged in

About 85 per cent. of the product of this tube-mill in the Consumers Company's Bellwood plant will pass a 200-mesh screen. Bag packer at right.

Two of the screens which take out chips from agricultural stone at the Consumers Company's Bellwood plant.

The 18- by 24-inch roll crusher recently placed in service at the McCook plant of the Consumers Company.

A view of the quarry of the Elmhurst-Chicago Stone Company.

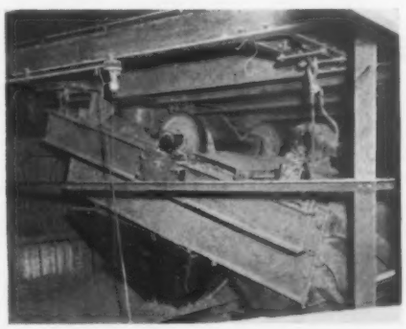
a hand-operated machine built at the plant.

The third product, even finer in size, is made by withdrawing the ball-mill product from the second silo and regrinding it in an Allis-Chalmers 5- by 15-foot tube-mill. This product, 85 per cent. of which will pass a 200-mesh screen, is carried to the third silo by a screw-conveyor. This silo serves a Bates bagger which packs the material in paper and cloth sacks for shipment.

This 22- by 40-inch double-roll crusher makes agricultural stone in the Elmhurst-Chicago plant.

Each of the storage silos is 20 feet in diameter and 50 feet high, the combined capacity being in the neighborhood of 600 tons.

Agricultural stone is also produced at the Consumers Company plant at McCook. The minus-No. 4 mesh product from the screens provides the primary source for this material and ¾- and 1-inch stone is withdrawn from the bins to augment the



One of the inclosed screens which pass agricultural stone at the Elmhurst-Chicago plant. It is connected to the dust-recovery system.

supply. An Allis-Chalmers Number 2 hammer-mill has been in service for some time to provide for the reduction of the large stone into agricultural-stone sizes. Last year, however, a new Pioneer 18- by 24-inch double-roll machine went into service to make agricultural stone. This machine is operated in closed circuit with the screens to insure the elimination of large particles.

Ball-mill and drier in background in the Bellwood plant of the Consumers Company.

One of the pioneer agricultural-stone marketers in the Chicago area is the Elmhurst-Chicago Stone Company. Its modern plant and quarry are located on the Chicago & Northwestern Railway just west of Elmhurst. This company has long advocated the use of limestone as "barn lime" and has promoted its use in this manner at northern Illinois county fairs for many years. Instead of spreading the stone directly on the soil, its use as barn lime is urged. By spreading the fine material over the barn floors, odors and bacteria are reduced. The abrasive effect also prevents the livestock from slipping and falling on the wet floors, a common cause of abortion among cattle. The limestone, piled up with the manure, is later spread on the fields in a single operation and none of its value as a soil neutralizer is lost. In fact, there is evidence to indicate that the chemical reaction which takes place makes its availability even more pronounced.

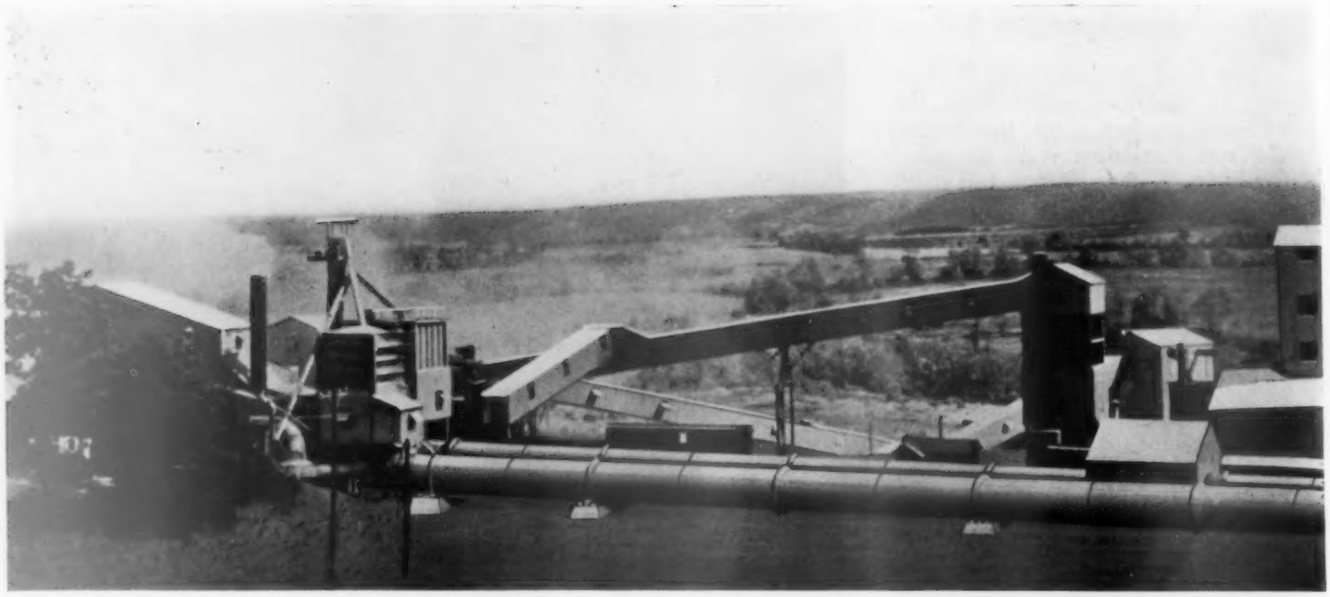
The central cyclone of the dust-collecting system at the Elmhurst-Chicago plant recovers considerable marketable dust.

Nearly all the agricultural limestone produced at the Elmhurst-Chicago plant is transported to the farms by motor trucks. Much of the stone is obtained directly from two Stephens-Adamson double-deck fine-sizing screens, the bottom decks passing the agricultural material (minus-$\frac{3}{16}$ inch stone down to dust) through chutes to the bins. A second source of this product is the Allington & Curtis dust-collecting system which keeps the plant clean and recovers much valuable dust. Screens and the discharge points on conveyors are fitted with dust hoods which are connected to the central cyclone by piping. Surplus sizes of stone are reduced to agricultural sizes by a set of Telsmith smooth rolls 40- by 22-inches in size, a Robins Gyrex vibrating screen separating the chips from the fine material.

Other producers and marketers of agricultural stone in the Chicago area are the Riverside plant of the Material Service Corporation; the Stearns Lime & Stone Company, Chicago; Thornton Quarries Corporation, Thornton; and the Marblehead Lime Company. No agricultural stone is produced at the Chicago plant of the Marblehead company at present, however, output being confined to its Quincy and Marblehead plants.

Asks Damages in Suit on Ordnance Contract

A suit asking $61,059 damages has been filed in federal court at Louisville by the Kaufman Koncrete Kompany, Inc., against the H. Kaplan Company, Chicago, and the Louisville Ordnance Depot. The Kaufman firm claims it had the subcontract for grading and laying concrete floors at the depot and the work was ordered stopped by the general contractor.



Retouched general view of plant showing both kilns with stone-crushing and the pebble-lime loading building.

SECOND RECORD-LENGTH KILN

another P AND Q exclusive

SINCE the acquisition in 1940 of the Chemical Lime Company with its high-quality limestone deposits at Bellefonte, Pennsylvania, by the National Gypsum Company, this outstanding operation has been improved by the addition of many new features. Approximately $800,000 has been spent to double its capacity for the production of a complete line of high calcium lime at low cost, for use in various types of industries, as well as building and agriculture.

The plant was erected in 1937 (*P&Q*, May, 1937) and was chiefly known for its simplified "stope mining" system, its 400-foot rotary kiln, and the application of direct firing and advanced combustion-control methods. The kiln has a capacity of about 200 tons of pebble lime in 24 hours.

Inclosed screen used to make minus 10-mesh ground quicklime.

The National Gypsum Company at once began an improvement and expansion program which has made this one of the largest and best-engineered lime and limestone-products plants in existence. The mining operations have been improved and expanded to meet increased demands. A second kiln 425 feet long has been installed along with its cooler and the necessary stone- and lime-handling equipment. The system for reclaiming the quicklime from storage and for grinding and loading it for shipment has also been improved and a new hydrating department has been built. Another important addition is a plant for the production of various grades of pulverized limestone usually from sizes of stone too small to be calcined efficiently in the kilns. This work was done with little interruption of the operation of the original equipment. The original design of the plant included provisions for such an expansion program and ample space remains for future additions.

The output of the new kiln in the Number 3 plant is averaging about 215 tons daily, thus more than doubling the original lime-calcining capacity. The hydrating capacity averages 12 tons per hour, or more than four times that of old plant Number 1. The old hydrating department is now being used to manufacture a retarder for gypsum plaster.

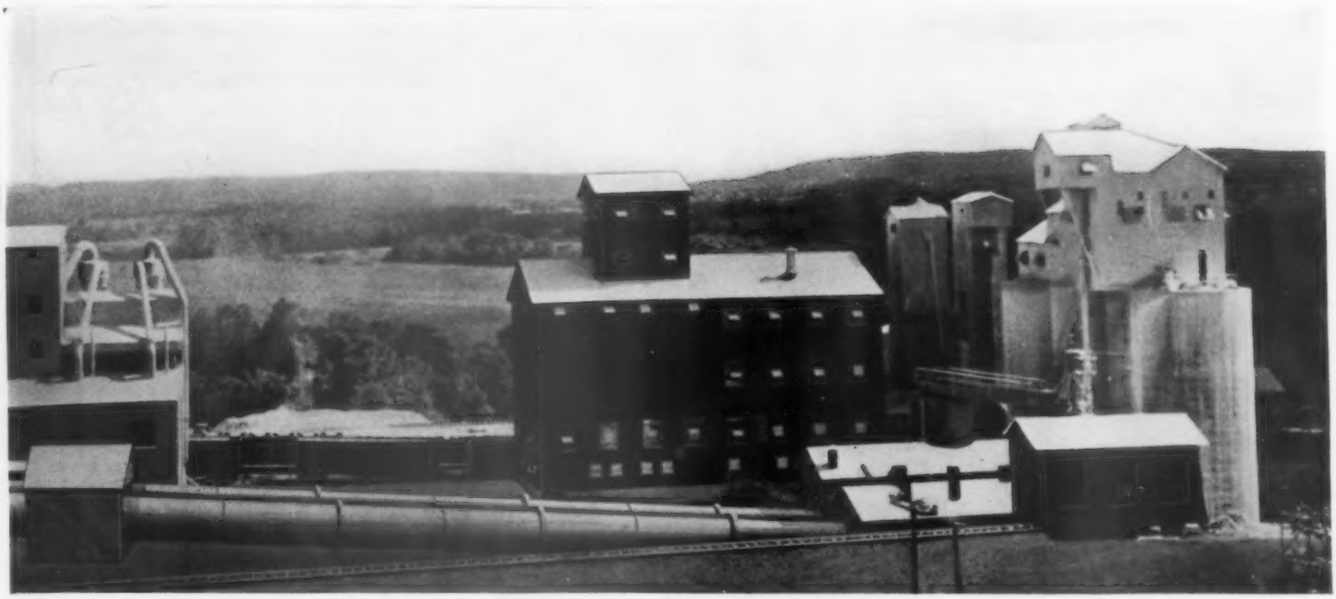
The new limestone-pulverizing plant has a capacity of about 25 tons per hour, of which about half is glass stone and the other half is agricultural limestone, mine dust or similar products. This is about three times

By W. E. TRAUFFER

the capacity of old plant Number 2, which, except for a storage building, is now being dismantled. Some of the equipment from plant Number 2 was used in the new plant.

A mine capacity of 200 tons per hour is aimed at and this will be attained after a few minor bottlenecks are ironed out. Although the mine output has been more than doubled labor requirements have been cut 15 per cent. The labor requirements in the plants have remained static in spite of the greatly increased production. The total power cost, in spite of the greater output, is only one-third greater than the former cost for all three plants combined.

The mine was rather completely described in the previous article but, as it was then still under development, another description is justified. The mine is located in the Bellefonte or Trenton ledge of limestone which has for many years been the source of raw material for plants in this area producing high-grade lime for the chemical and other industries. This high-calcium stone has



storage department at left. Also shown are the pulverized-limestone building, and the quicklime-storage silos.

IN SERVICE AT BELLEFONTE

an average carbonate content in excess of 98.5 per cent. The ledge stands at an angle of 72 degrees with the horizontal and averages 70 feet in thickness.

The mine is a typical simplified shrinkage-stope form of operation similar to that employed by the American Lime & Stone Company (*P&Q*, March, 1937) in the same ledge. The 1,000-foot long, 18-degree entrance slope is about in the middle of the 8,400-foot length of the ledge now controlled by the company and extends to the main haulage drift level which is about 335 feet below the surface at that point. This slope is 9 feet high and 14 feet wide and for some distance below the portal is lined with concrete. In addition to the material belt-conveyors, this slope has a stairway and a hoist car for transporting men and materials between the surface and the mine.

The main drift is at right angles to the slope and has been developed to the west as far as the ninth stope. Most of the mining is now being done in the sixth and seventh stopes. In the near future it is planned to work east from the slope. There is enough rock on this level for about 10 years' operation at the present capacity, and when this nears exhaustion, another level will be developed about 250 feet lower.

The stopes average about 250 feet in length and are spaced 40 feet apart. They are worked as high as roof conditions will allow, which has been a maximum of 225 feet. In each pillar between stopes is a man-raise with cross-cuts to both stopes every 25 feet.

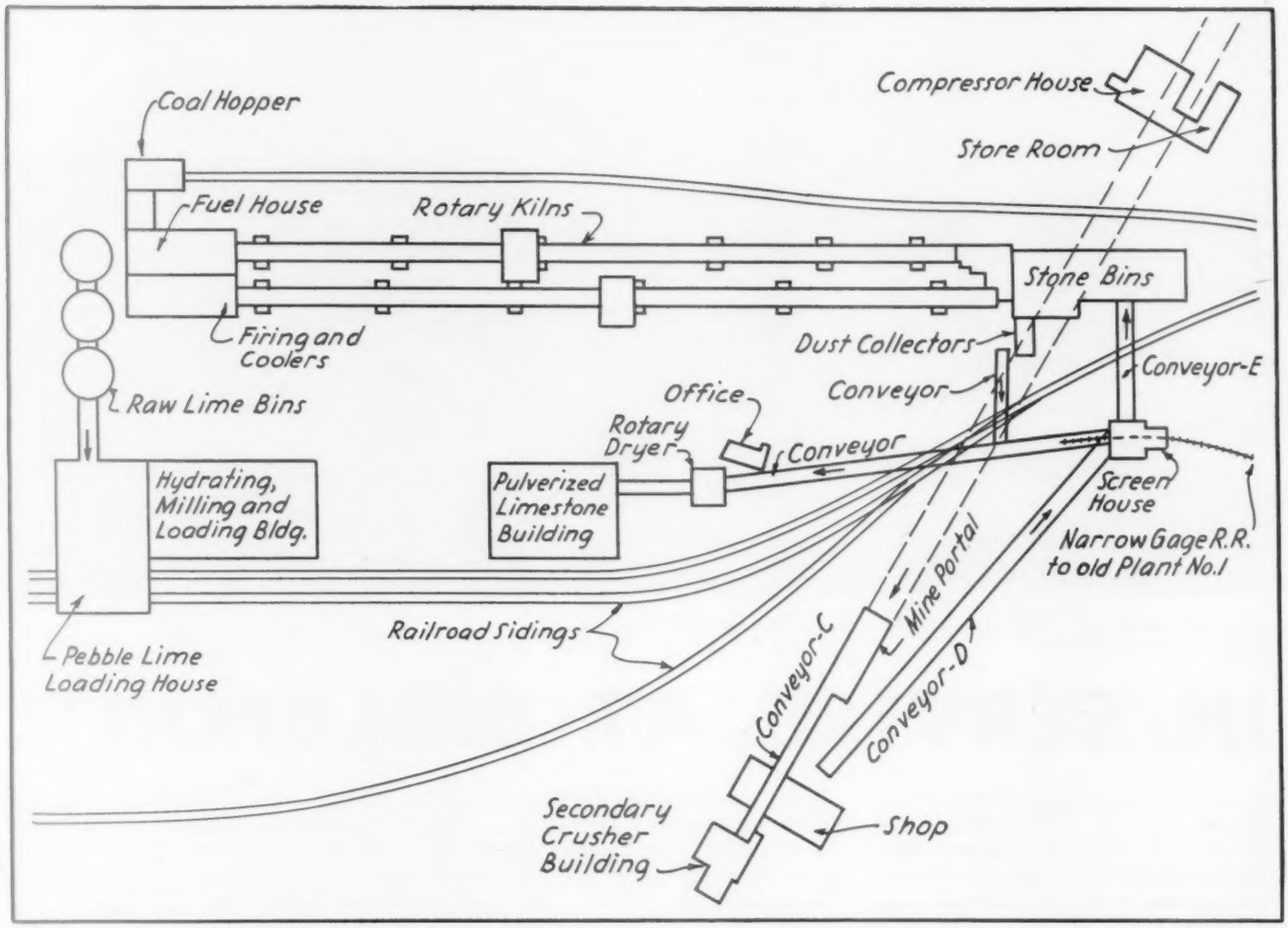
The usual drilling and blasting methods common to this type of mining are employed. Ingersoll-Rand N75 drifter drills and SAR35 stopers are used and a scraper hoist is used for loading cars on development work. Ingersoll-Rand drill sharpeners are used and air for the drills is supplied at 100-pound pressure by a 12½- and 20- by 14-inch Ingersoll-Rand Imperial Type 10 compressor located on the surface directly over the mine.

Under each stope are five grizzly openings, spaced 50 feet apart, to which the rock is drawn from the stope through material-delivery chutes. Under the grizzlies are pockets from which cars are loaded through arc gates. Six new Easton 6-ton Granby type, all-steel side-dump cars with roller-bearing axles are used in addition to the original wooden cars. They are hauled by two storage-battery locomotives, a 4-ton Mancha and a 6-ton Goodman.

The stone is discharged from the cars into an 1,800-ton loading pocket. This has two openings from which Traylor pan-conveyors feed the stone over 6-inch bar grizzlies. The stone passing over the grizzlies goes to the 16-inch Traylor gyratory primary crusher. The crushed stone and that passing through the grizzlies is discharged on a 30-inch by 313-foot belt-conveyor, which discharges on the first of the two 30-inch by 480-foot belt-conveyors leading out of the mine.

The final mine conveyor formerly discharged the stone on a screen which removed 6- to 9-inch kiln stone for plant Number 2. This screen is now used as a scalper. The oversize stone is discharged into the Traylor Number 7½ gyratory secondary crusher. A 24-inch by 180-foot belt-conveyor takes all the stone to a transfer house, where a 4- by 6-foot Robins Gyrex 2-deck screen formerly removed the minus-⅜-inch

Direct-firing coal mill and fan which fire the new kiln.



Plan of the building arrangement at the Bellefonte plant.

material for grinding in plant Number 2. This material now goes to the conveyor feeding the new glass-rock plant to be described later.

The plus-⅜-inch stone passing over this screen is carried on a 24-inch by 50-foot belt-conveyor with a Dings magnetic head pulley, to a 4- by 6-foot Robins Gyrex 2-deck screen with 1¾- and 1¼-inch openings. The two coarse sizes produced are chuted into two 1,000-ton storage compartments. The minus ¼-inch stone goes to another 3- by 5-foot Vibrex screen with ¾-inch openings on its single deck. The two sizes made by this screen drop into two more storage compartments. These four sizes of stone are used to make four sizes of pebble lime.

Both kilns as seen from the feed end. Lime-storage silos in background; hydrate and pulverizing buildings at left.

The stone is discharged from them on an 18-inch by 105-foot reclaiming belt-conveyor and a bucket-elevator discharges it into the two 160-ton kiln-feed bins.

The stone for the original kiln, Number 1, is supplied by a Webster pan-feeder. A 2- by 5-foot Jigger screen has been installed at the discharge end of the feeder to remove bin-broken material and dust from the stone going into the kiln.

The rate of feed to the new kiln is controlled by a Schaffer Poidometer, which discharges the stone over a 2- by 5-foot Deister Concentrator Company Leahy screen before it goes into the kiln. The bin-broken material from both screens goes to a bucket-elevator which feeds a series of belt-conveyors running to the glass-rock plant.

The original Number 1 kiln and cooler installation has fulfilled expectations and has been changed only in minor details. This Traylor 400-foot kiln was, when installed, said to be the longest all-welded kiln in existence. It was also probably the longest rotary kiln used in a lime plant. A feature of this kiln was the use of openings in the shell near the hot end to bring in regulated

quantities of secondary air from the atmosphere to provide the additional oxygen necessary to lengthen the flame. The use of these openings has been discontinued but similar openings near the feed end are being used to reduce the temperature of the exit gases. The 700-degree temperature obtained is low enough so that raw limestone can be introduced into it without appreciable spalling or cracking.

The induced draft for this kiln is supplied by a Size 12 Buffalo fan which draws the hot gases through two 11-foot Kennedy-Van Saun cyclones that remove the dust.

This kiln is fired through a Traylor Cheesman luminous double-tube burner by pulverized coal from a Kennedy-Van Saun air-swept direct-firing ball-mill.

The lime is discharged from this kiln at a temperature of about 2,000

Six-ton cars being dumped into loading pocket over primary crusher in mine.

degrees F. into the Traylor 7- by 42¼-foot indirect-heat rotary cooler. This has seven 16-inch-diameter tubes which extend its full length and through which the lime passes without coming in contact with the cooling air. The lime is discharged from the cooler at a temperature of about 450 degrees F. The indirect coolers allow the use of high-velocity cooling air, which improves the efficiency of the coolers without dust loss and prevents hydration of the lime in the coolers when the humidity of the cooling air is high.

The new 8- by 425-foot Traylor all-welded kiln has six supporting rollers with oil-lubricated water-cooled trunnion bearings. It is driven through V-belts and a Falk gear-reducer by a 60- to 75-horsepower Westinghouse 4-speed induction motor which was selected because of

View from discharge end of the old and new rotary kilns.

the economy of a.-c. power. The Poidometer feeder is driven by a smaller 4-speed a.-c. motor and these are so interconnected that they are always in synchronism and are controlled by the same push-button switch. This kiln has an auxiliary drive for emergency use. A Hercules gasoline power unit and a Link-Belt speed-reducer are connected by a clutch to the high-speed shaft of the Falk reducer through which the kiln is driven. The kiln has a pitch of ½ inch per foot and at its usual speed of 1 r.p.m. has produced in excess of 230 tons of lime daily and has averaged 215 tons.

Throughout a distance of 60 feet from the discharge end the kiln is not insulated. For the first 10 feet of this section it is lined with 45-per cent. alumina brick and for the next 50 feet with 70-per cent. alumina brick. In the next 57 feet of the kiln 2-inch high-temperature insulation and 45-per cent. alumina brick is used. For 134 feet there is 3-inch high-temperature insulation and 9-inch, 40-per cent. alumina brick and for 76 feet there is 2-inch insulation and 8-inch, 40-per cent. alumina brick. The remaining distance (98 feet) at the feed end of the kiln is uninsulated and is lined with 6-inch Duro brick. Various makes of brick are used.

This kiln is direct-fired by a Raymond Number 412 bowl mill which is grinding the coal to a fineness of 92 per cent. through 200-mesh at the rate of almost 2 tons per hour. A highly-volatile coal, with a grindability factor of about 114, is being used. It has a 14,000-B.t.u. content on the dry basis and contains about 5 per cent. moisture and less than 6 per cent. ash. The fuel rate of this kiln-firing installation is about 4 to 1 but no accurate figures will be available until the total coal consumption for the past year is balanced against the total lime production. The original coal-handling system has not been changed, but a screw-conveyor was added to feed the coal to the bin over the new mill.

The kiln draft is supplied by a Buffalo Size 11, Type SCL fan which is driven by a 50-horsepower Westinghouse induction motor. The hot air is drawn into a 10- by 20-foot expansion chamber, which settles out the dust before the air is exhausted to the atmosphere through a steel stack. Screw-conveyors feed the dust from this chamber, and from the two cyclones serving the original kiln, to

Locomotive and one of the cars in the mine.

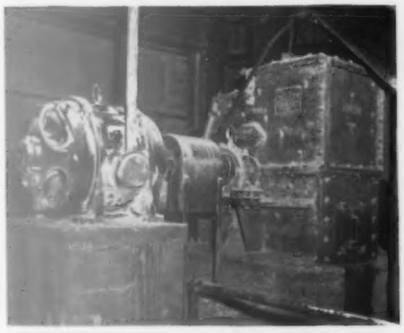
Drive of the new kiln. Regular drive at left and auxiliary gasoline power unit at right.

a bucket-elevator. This carries the dust, along with the bin-broken material previously mentioned, to a belt-conveyor feeding the main conveyor running to the glass-rock plant.

The lime from this kiln is discharged at a temperature of about 2,000 degrees F. into the new 7½- by 44-foot Traylor indirect-heat, tubular-type rotary cooler which is driven, usually at a speed of 5.6 r.p.m., by a 25-horsepower motor.

This cooler is an improvement on the original Number 1 cooler. It has 14 pear-shaped tubes radially disposed and extending for its full length. One of these tubes is blank and is used to carry cool atmospheric air into the hot end of the cooler to keep the temperature down. The other 13 tubes carry the lime. This feature is a fairly recent development which has greatly increased the efficiency of the cooler. The use of pear-shaped tubes, instead of the round ones used in the original cooler, has made it possible to use a greater number of tubes and thereby provide a much greater combined heat-transfer area. The lime is discharged from this cooler at a temperature of about 200 degrees F.

A Buffalo Size 7 fan, driven by a 60-horsepower Westinghouse motor, blows the hot air from the cooler into a stack from which the hot air for the coal mill and the primary air and part of the secondary air for the kiln are drawn. This system and a similar system on the Number 1 cooler are interconnected so that when either kiln is being started up after a shutdown hot air for it can be drawn from the other system.



Hammer-mill in the hydrating building. It is used for the reduction of quicklime.

Weighing feeder proportioning quicklime to the hydrator mixer.

Both the kilns are equipped with thermocouples at three points and these are connected to a Leeds-Northrup 10-point selective indicator which is on the kiln-control board and shows the temperature of the primary and secondary air going into the kilns. The exit-gas temperature of the Number 2 kiln averages about 1,000 degrees F., the temperature at the kiln-drive station averages about 1,700 degrees, and that at the discharge end is about 2,200 degrees. The drying air for the bowl mill is varied manually with the moisture content of the coal and its rate of feed so as to keep the temperature of the primary air for the kiln at 150 degrees F. The drying-air temperature varies between normal limits of 300 and 550 degrees F. The secondary-air temperature at the burner is about 400 degrees F. On the kiln-control board also are Bailey draft gages, CO_2 recorders, and the necessary meters and switches. The kiln draft is controlled electrically by manually-operated remote-control switches.

Each cooler has its own series of two Link-Belt bucket-elevators which carry the pebble lime to the top of the storage silo structure. These elevators feed a revised screening and conveying system using one of the older model Tyler Hum-mer screens and a new Type 38 Hum-mer screen. From these screens the several sizes of pebble lime are discharged with little breakage into storage by means of Holmes spiral chutes.

One of the two 5-roller high-side mills used for pulverizing limestone.

The storage consists of three reinforced-concrete silos, each 30 feet in diameter and 66 feet high, with a combined capacity of 2,500 tons. Each silo is divided in halves by a vertical partition.

The pebble lime is reclaimed from storage by a horizontal tunnel belt-conveyor which runs to the loading

building and from which it can be discharged to either of two bucket-elevators. A short elevator feeds a belt-conveyor from which the lime is discharged through a spout into cars on two loading tracks. A reversible belt-conveyor feeds it to another spout for the bulk loading of cars on a third loading track which has just been completed.

The second or longer of the two elevators feeds the pebble lime to a Hum-mer screen from which the fines go to a 60-ton steel storage tank or to the bulk-loading system just described.

Under these tanks is a 4- by 9-foot Kennedy-Van Saun air-swept ball-mill which operates in closed circuit with a 10-foot Gayco mechanical separator. The rejects from the separator are returned to the mill and the product is discharged into a

Reversible hammer-mill in pulverizing plant. Scalping screen above.

60-ton steel tank over a 2-spout Valve Bag packer.

The material from the short elevator is carried on a series of two belt-conveyors to the new hydrating plant. There it can be discharged into a Jeffrey hammer-mill or it can be by-passed to a bucket-elevator, which can either feed the pebble lime to a Deister Concentrator Company Leahy screen or by-pass it to a hydrator-feed tank. The minus-10-mesh throughs of this screen go to the same tank. The screen oversize can either go to this tank or be returned to the hammer-mill.

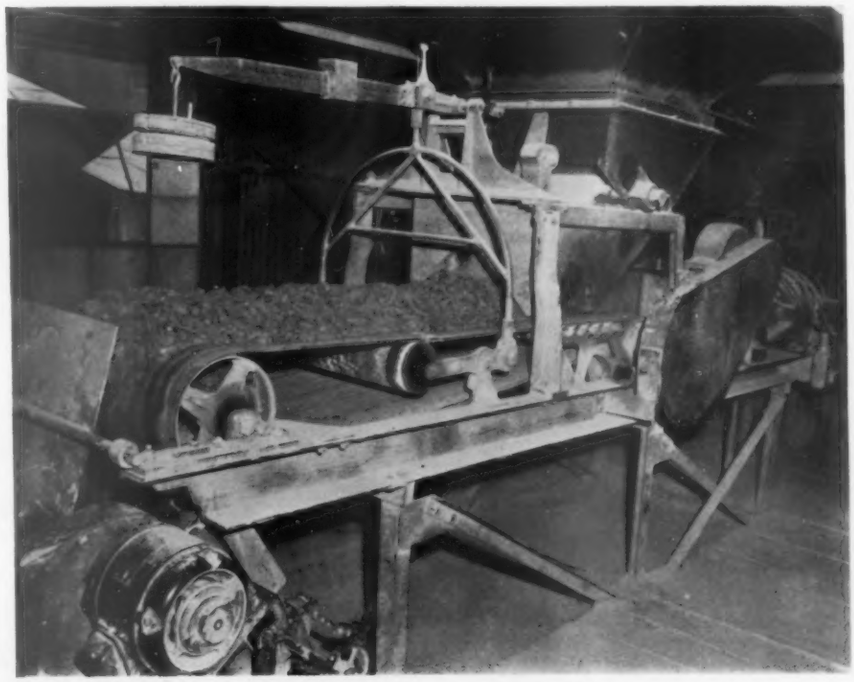
A screw-conveyor withdraws the lime from this tank to an elevator feeding a small surge bin over the hydrator. A Hardinge Feedometer controls the feed from this bin into the "Eberhart" mixer of the Number 1 Schaffer 12-ton per hour continuous hydrator. This mixer is driven by a 3-horsepower Westinghouse motor through a Falk reducer and the vertical shaft of the hydrator is driven by a 20-horsepower Westinghouse motor through a Falk right-angle reducer. The hydrated lime is elevated to a mill-feed bin with two 25-ton compartments. These feed two Number 3 Raymond automatic pulverizers which are equipped with double whizzers and are connected to fans and cyclones. A set of three reversible screw-conveyors can feed the lime from either cyclone to any of five storage compartments. The cyclones are vented to a Raymond "stocking" bag type of dust collector.

Draft fan on the new kiln.

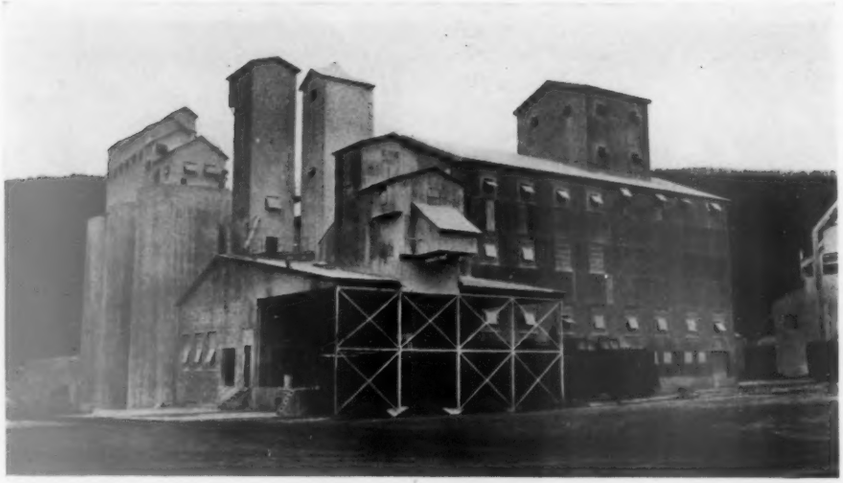
The hydrated-lime storage consists of four reinforced-concrete silos and an inclosed star bin with a combined capacity of 1,000 tons. These were built by the Nicholson Company by the slip-form method. The silos and the bin have conical bottoms terminating in steel-plate cones of 8-foot radius on the slope. This

One of the pan feeders to the primary crusher in the mine.

design makes arching of the material nearly impossible, but air jets are provided as additional insurance. Under each of the five storage compartments is a 3-spout Valve Bag packer. Under each packer is a spillage-reclaiming hopper from which a screw-conveyor returns the reclaimed lime to an elevator ahead of the mill-feed bins. It has been told how the minus-⅜-inch stone from the second stone screen, which formerly went to plant Number 2 for processing, is now carried on a 24-inch by 150-foot belt-conveyor to the 400-ton drier-feed bin of the glass-rock plant. If desired, coarser stone can also be diverted at this screen. Another shorter belt-conveyor feeds to this conveyor, about at its middle point, the collected dust and the bin-broken



Weighing feeder serving the new kiln.



Lime-storage silos (left) and the hydrating building. Unloading station is in foreground.

material from the kiln-feed departments.

A 24-inch by 3-foot Link-Belt pan-feeder draws this material from the bin into a 6- by 60-foot Kennedy-Van Saun rotary drier. This has an L-shaped fire-box into which the coal is fed by Riley stokers in the opposite direction to the travel of the stone through the drier.

The dried stone is elevated to a series of screens. When stone over ⅝ inch in size is being processed it is discharged on a Tyler Niagara single-deck screen with 5/16-inch openings immediately over a hammer-mill. Smaller stone is discharged instead to a pair of 4- by 5-foot Tyler Hum-mer single-deck screens equipped with 16-mesh wire cloth. The oversize from these screens is also discharged into the Pennsylvania Size C-5-30 Trojan Series reversible hammer-mill from which it goes back to the Hum-mer screens in closed circuit.

Automatic pulverizers with double whizzers which grind the hydrated lime.

The material falling through the 16-mesh screens, which is top sizing for glass stone, goes into a 10-foot-diameter Kent mechanical separator. The tailings from the separator are finished glass stone from which all except traces of the minus-100-mesh dust and graded amounts of coarser material up to 20-mesh size have been removed. This material is loaded direct into cars for shipment by a screw-conveyor which feeds a portable car loader.

The minus-20-mesh fines from the separator are carried by a bucket-elevator and screw-conveyor to feed bins over two Raymond Number 5057 high-side 5-roller mills. These have dual whizzer separators with variable-speed drives. Each mill has a fan to blow its product to cyclone separators which are vented to the atmosphere. The product of the cyclones is 75 per cent. passing 200 mesh, which drops into a bin over two 3-spout Valve Bag packers.

The electric power used in these operations is purchased at 23,000 volts and is metered on the primary side of the company-owned substation which gives the company a 10-per cent. discount on its power bills. The actual power cost is ¾ cent per kilowatt-hour. Power is distributed at 440 volts for the smaller motors and at 2,300 volts to all motors of 50 horsepower or over except a few which are not conveniently located. An over-all power factor of 95 is maintained in the circuit through the use of two synchronous motors and 300 kilovolt-amperes of static condensors. A 300-horsepower synchronous motor with an 0.8-per cent. leading power factor drives a d.-c. generator which is on the firing floor and supplies current for the variable-speed motor driving the Number 1 kiln. A 75-horsepower synchronous motor drives the origi-

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Seattle — Star Machinery Company
Spokane—Andrews Equipment Service
WEST VIRGINIA
Fairmont — Interstate Engineers & Constructors
WISCONSIN
Eau Claire — Bradford Machinery Company
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Madison — Western Equipment Company
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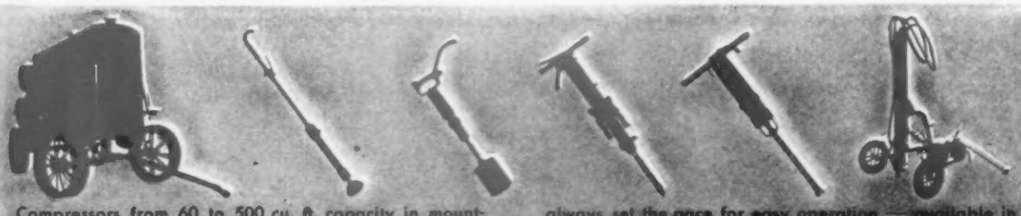

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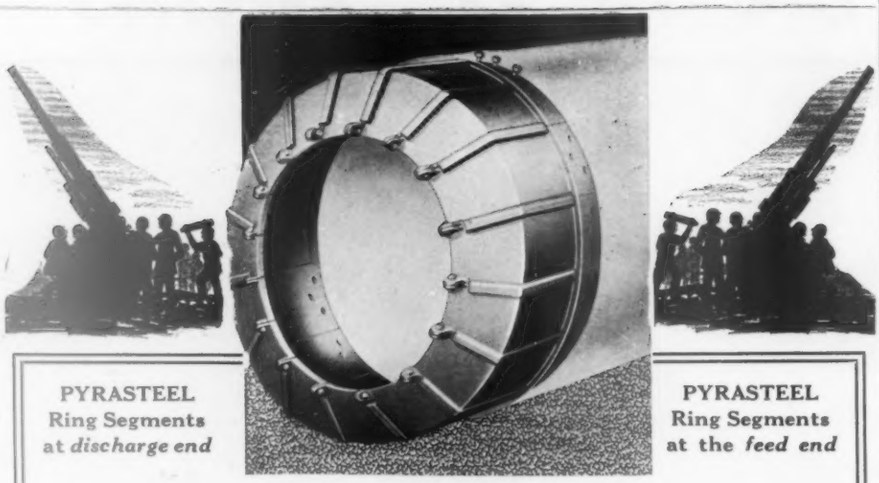

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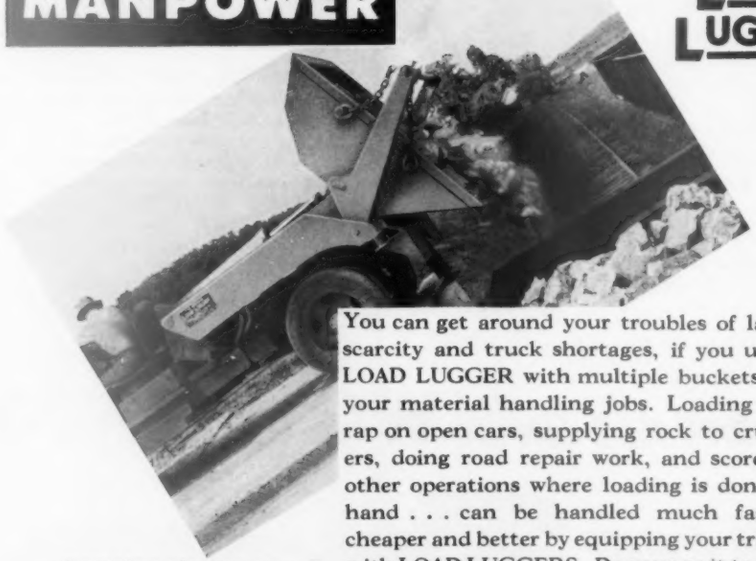

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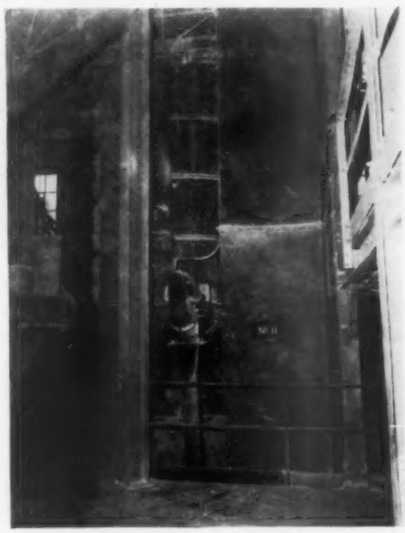
nal coal mill. The total connected motor load for all operations is now 2,067 horsepower.

The hydrating plant and the limestone-flour plant are now being operated only during off-peak power periods and the mine will soon be put on the same basis. The loading department, along with the kilns, is operated 24 hours daily.

The principal product of this plant has always been pebble lime for chemical and industrial uses. The pulverized quicklime was sold chiefly to the chemical and building trades but the latter market has given way almost entirely to the vital demands of the steel industry which alone takes more than half of the total output of the plant. The pulverized limestone goes to other important industries. All the products are made in various sizes and grades. More than 75 per cent. of the output of the plant goes to industries filling government orders and most of the



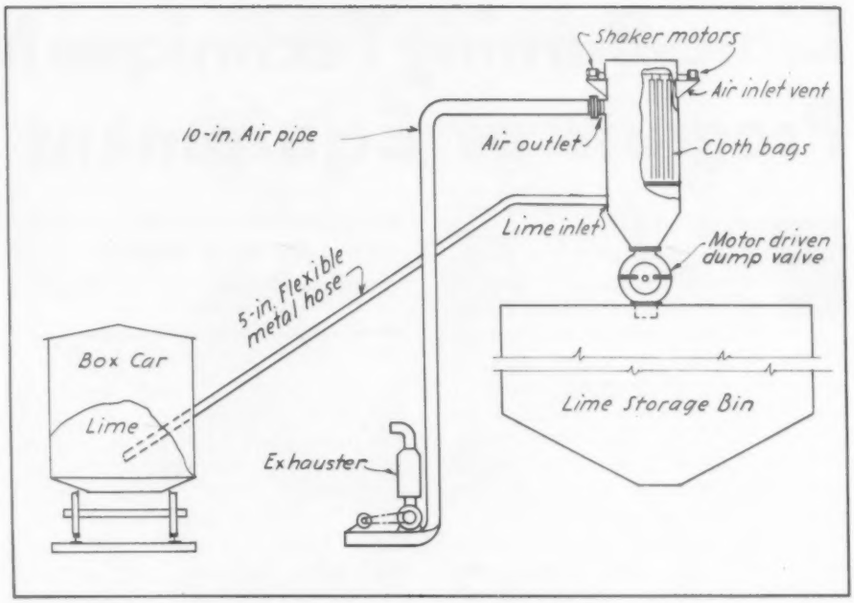
The 12-tons per hour lime hydrator. Elevator in foreground.

remainder is used indirectly in the war effort. The trademarks and copyrights of the Chemical Lime Company are maintained but most of the products are sold under National Gypsum Company brands.

The original article on this plant went into some detail in describing the financial arrangement under which this plant was built by the Chemical Lime Company. Briefly, an RFC loan of $720,000 was negotiated in March, 1936, to purchase the necessary additional deposits and to build the plant. On December 2, 1937, the company went into the hands of receivers who served for about 6 weeks. On January 7, 1938, the company went into 77B of the revised Federal bankruptcy act and

trustees were appointed by a Federal court. This arrangement was in force until January 1, 1941, when the property was taken over under a long-term lease by the National Gypsum Company. Under the terms of this lease the RFC retains the title to the property and pays for any necessary additions or improvements made to it. The rental paid will amortize the RFC investment over the lease period, at the end of which time the National Gypsum Company can take over the property if it desires to do so.

The plant improvements were designed by the company's engineering and operating staff and carried out under their supervision. The works manager is Bayard Magee, who assisted in the construction of the original plant and was maintenance engineer and later general superintendent for the Chemical Lime Company. He is assisted by: E. E. Espenshade, office manager; M. W. Ardary, personnel manager; Henry Ollila, mine captain; R. E. Gill, chief chemist; Wendell Bearce, plant engineer; Lloyd Sampsell, master mechanic; Linus Gill, chief electrician; and Guy Kline, plant foreman.



A RECENT issue of *Limeographs*, published by the National Lime Association, contained an interesting description of the penumatic handling of bulk lime at the Everett, Washington, pulp mill of the Weyerhauser Timber Company.

The system is shown diagrammatically in the above sketch. An operator inserts the end of a flexible metal hose into a pile of pebble lime in a box car and keeps it covered. From this point the lime is drawn to a separator above the storage bin. The lime enters tangentially and drops to the bottom where it is passed, through a star valve, from a 6-inch vacuum to the storage tank at atmospheric pressure. The air and attendant dust pass to the filter bags. These bags are equipped with motor-driven shakers and, on a predetermined cycle, a portion of the bags is back-washed with air.

The vacuum pump is a wet-type rotary exhauster driven by a 30-horsepower motor and maintaining a vacuum of 6 inches Hg. Pebble lime which will pass a 1-inch mesh is handled at a rate of better than 6 tons per hour, there is no objectionable dust involved in the car or elsewhere, and one man handles the entire operation. The system is said to have been in successful service for nearly a year and has been almost entirely free of maintenance.

Tight Situation Seen for Open-Top Cars

The Office of Defense Transportation has recently warned that serious delays in the movement and delivery of bulk commodities by railway threaten to occur during 1943 as the result of tight situations in the supply of open-top freight cars and railroad motive power. Such stringencies are likely to appear more frequently and be of longer duration this year than in 1942.

More severe car and locomotive stringencies are expected to develop, ODT officials said, partly because of increases in the volume of freight moving in open-top cars and in the distances it must be hauled and partly because of other factors affecting the motive-power and car-supply situation. Considerably more than half of all the freight moved by the railroads is carried in open-top cars.

According to ODT estimates, open-top carloadings, exclusive of loadings of ore in ore cars, will total 19,678,000 cars in 1943, as against 19,297,000 in 1942. The tonnage included in the 1943 loadings is estimated at 1,003,485,000, compared with 981,495,000 for 1942.

Loadings and tonnage of most commodities moving in open-top cars are expected to rise in 1943. The only substantial decline anticipated is in sand, gravel, and stone, reflecting the near-completion of war construction programs. But that decline is more than offset by estimated increases in coal movements alone. Material increases are expected also in loadings of iron ore and iron and steel manufactures.

While estimated increases in total open-car carloadings and tonnage are relatively small, ODT officials pointed out that those increases indicate only partially the size of the additional burden which 1943 open-top car traffic will impose on available car supplies and motive power. Many shipments in open-top cars, for example, will have to be moved over longer distances, tying up cars and locomotives for a longer period of time.

The ODT asserted that various efforts were being made to alleviate threatened car and motive-power stringencies. Steps taken to bring about heavier loading of freight cars, to reduce empty-car movements and excess hauling, and to spread out seasonal movements of such commodities as coal were mentioned in this connection.

The War Production Board to date has authorized delivery to the railroads of 17,588 new hopper and gondola cars and 100 Diesel switch engines in the first six months of 1943, and delivery of 250 steam locomotives and 36 Diesel locomotives for road freight service in the first eight months of this year. ODT officials indicated that if additional equipment were not authorized, and if other measures failed to relieve materially the motive-power and open-top car stringencies, it might become necessary to adopt some system of freight priorities, in order to protect the production and movement of essential products.

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Lime-Burning Technique Makes Marked Progress as Equipment Is Improved

By W. S. DICKIE
Manager, Process Equipment Division
Vulcan Iron Works

THE PERIOD of depression, from 1929 up to the time when business became better just previous to World War II, served the lime industry, as it did other industries, in giving it an opportunity which it would not otherwise have had to take stock of its operation, equipment, and other details, resulting in improvements in all phases of lime burning. The opportunity for improvement was given not only to the lime burner, but also to the manufacturers who furnish the equipment used in lime burning. This would naturally start with the rotary-kiln manufacturer, who took the opportunity to improve the design of his kiln, particularly in the matter of supporting bearings and driving mechanism for the kiln. It was during this period that welded construction of shells also came into its own, to the almost total exclusion of riveted shells. The kiln manufacturer, either independently or in conjunction with the lime burner, experimented with and designed auxiliary equipment, such as preheaters for the preheating of stone and recovery of B.t.u.'s from the relatively high-temperature exit gas, and more efficient coolers for the burned lime, by means of which preheated air for combustion in the kiln is recovered. Much work, however, is still to be done in connection with these two auxiliaries. In addition, in spite of the fact that vertical kilns are probably not used in the larger lime-burning plants, there were improvements made in the design and construction of this type of kiln.

It is our opinion that not too much should be made of the relative virtues of the rotary or vertical kiln. We believe that each has a place. Vertical kilns of very inexpensive design may be installed in multiples, each producing a relatively small amount of lime per day, in locations where the demand for lime is not too great or the capital to be invested is not sufficient for a rotary-kiln plant. To be even fairly efficient a rotary-kiln lime plant should produce not less than 50 tons per day, and the efficiency increases, up to a point, as the capacity is increased. A vertical kiln of improved design will show greater efficiency, as far as fuel is concerned, when the required capacity is small; but as the size of the plant increases, the rotary kiln more nearly approaches, in overall efficiency, the efficiency of the vertical-kiln plant. Some vertical kilns have been built of comparatively great capacities and with mechanical features, such as continuous discharge, which increase the efficiency over the plainer type. Rotary kilns, however, have an advantage in that limestone in practically any form or condition may be calcined in them, from graded dry stone to wet sludge or slurry.

There are two definite schools of thought as to the length of rotary kilns. There are those who believe that there is greater efficiency in extremely long kilns, where the maximum B.t.u.'s available are utilized from the fuel. On the other hand, accurate records kept in plants where shorter kilns are installed seem to prove that there is very little increased efficiency in extracting these "hard-to-get" B.t.u.'s. It seems to have been demonstrated that there are two grades of heat necessary in the production of lime—the high-grade heat which does the final calcining, and the low-grade heat which may or may not be recoverable, depending on one's attitude as to the length of the kiln. Among other tests made by lime burners who are really interested in the theory of lime burning, there have been measurements made showing the rate of calcination at numerous points in the length of the kiln, and curves have been plotted showing heat absorption and the loss of carbon dioxide as the material progresses through the kiln. Those curves which we have seen indicate a fairly rapid absorption of heat at the feed end of the kiln, where the limestone is dried and brought up to a temperature of about 400 degrees F. Then the rate of absorption slows down markedly, and the curve flattens out until the limestone is nearly at the calcining zone, where it rises sharply and, in a short length of kiln, to the calcining temperature. The curve then drops off, again sharply, to the discharge end of the kiln. A comparison of curves plotted from different length kilns, from rather short to extremely long, shows roughly the same curve for the feed end and for the calcining zone, but with the intermediate, or preheating, zone lengthened only in the longer kilns.

Rotary kilns have been equipped with recording and control instruments, resulting in much more efficient operation, since their use, as a rule, increases capacity and decreases fuel consumption. There is somewhat a difference of opinion as to how far instrumentation and control should be carried, but it has been proved that even the minimum number of instruments has a decidedly beneficial effect on operation. Control of temperature is secured by means of an instrument recording temperatures at or near the discharge end, and another at a point somewhere near the feed end. This gives a differential reading, which is important, but neither reading is necessarily correct. The point in this matter is that operation is influenced by the differential rather than the actual reading. A second pair of instruments consists of a pressure gage in or below the firing hood, and a draft gage at the feed end. Again it is a matter of differential rather than an accurate reading. The fifth instrument is the gas-analysis equipment, which may be simple and read only CO_2, or complicated and read perhaps four of the gases. The sixth is a kiln-speed indicator, which is usually interconnected with the kiln feed. The various instrument makers have issued bulletins or abstracts of papers which have been presented at meetings, which should be read before instruments are installed.

It has been demonstrated that draft control is of great importance. This control may be secured by one of the many means available and can be either mechanical or hand-operated. Our feeling is that instrumentation and control can be carried too far, even to the point where it is necesary that an additional man be engaged to take care of the instruments. There seems, however, to be complete agreement among lime burners as to the desirability of instruments. Also, in talking to a number of operators it is found that

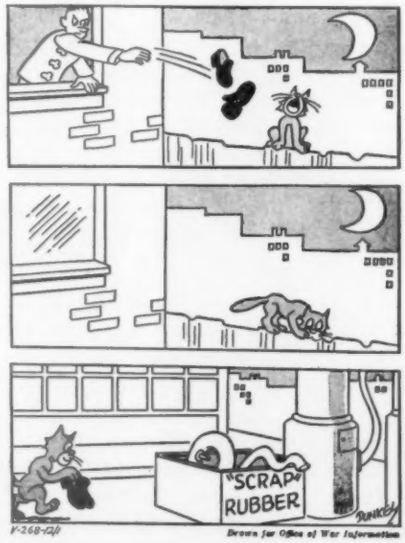
the feeling among them is that after instruments have been installed it is much more desirable to hire the services of an intelligent young man as the kiln burner than one who we have always been led to believe is necessary in a plant because of his experience in determining kiln conditions by sight.

There is an instance where the CO_2 gas from a rotary kiln was used in another operation and where the kiln was well instrumentized. A check of the recordings on all the instruments proved that the best operation of the kiln, from all standpoints, was secured when the CO_2 content and the exit-gas temperature were held at given figures. If we disregard the possible inaccuracy of the readings, when the CO_2 content of the gas registered about 25 per cent. and the exit-gas temperature at the base of the stack was 550 degrees F., then the greatest production was secured and the least fuel was used.

In the interest of fuel economy a number of designs of sealing rings have been used. One of the inevitable results of the use of sealing rings at the discharge end of kilns has been the effect of the high temperature at that point on the kiln shell. There seems to be no doubt but that the closing off of external air from the end of the kiln has had a detrimental effect on the end of the shell. The thought might be considered as to whether enough has been gained by the installation of perfectly tight seal rings to balance off this detrimental effect. It might be said at this point that there are some operations, particularly chemical, where reducing atmospheres are necessary and tight sealing rings, therefore, are necessary. When trouble is encountered with the burning off of the discharge end of the shell due to the high temperatures encountered, there have been a number of designs of special kiln ends which are made of heat-resisting metals. There have, on the other hand, been cases where heat-resisting metals, which will resist all the conditions encountered, do not exist. There has been what might be called a sealing ring installed on several kilns in a process other than lime burning, where temperatures involved are about the same and where a given and governable amount of outside air is allowed to be passed around the end of the shell. The thought in this case is that the cold air will have a beneficial effect on the shell end. The question, which can be answered only by experience, is whether the cost of maintaining heat-resisting ends is greater than the cost of heating the infiltrating cold air. Unfortunately these kilns have not been in service sufficiently long to answer this question, although the day will come when it will be definitely answered because other kilns in the plants of this same company are equipped with tight sealing rings.

Many kinds of fuel, in fact practically all kinds, may be used in the rotary kiln and nearly all kinds in the vertical kiln. In determining the kind of fuel to be used the matter of economics enters into the problem, and a choice of fuel depends on its availability and price at the plant. We will take first the vertical kiln, which may be fired by wood, coal, gas, or oil. In vertical-kiln firing, when coal is spoken of as fuel, it must be considered as coal fired on a grate, as we have no knowledge of a vertical kiln being fired with pulverized coal. Gas, however, may be any one of the fuel gases, including natural gas and producer gas. Wood is used in very few cases in this country, although indications shown by inquiries from foreign countries, particularly South America, seem to point to the desirability, because of the availability, of wood and the non-availability of other fuels. There are advantages and disadvantages to the use of the various fuels, which apply to both the vertical and rotary kiln. These are given just below. A rotary kiln may use all the fuels enumerated above, in addition pulverized coal may be used and, in fact, is used in a number of the more progressive plants in the United States.

The comparison of fuels for lime burning given below is, of course, based on a number of assumptions, which are given first. Following the cost, based on these assumptions, are the various advantages and disadvantages of the fuels.



Comparison of Fuels for Lime Burning

Assuming—Coal at 13,000 B.t.u.'s per pound. Bituminous producer gas at 140 B.t.u.'s per cubic foot. Fuel oil at 144,000 B.t.u.'s per gallon (7½ pounds per gallon).

Assuming—Ratio of lime to coal at 4 to 1, or 500 pounds of coal to 2,000 pounds of lime, or 6,500,000 B.t.u.'s per ton of lime, which equals 6,500,000 ÷ 140 = 46,429 cubic feet of producer gas, or 6,500,000 ÷ 144,000 = 45 gallons of oil.

Assuming—Coal at $8.00 per ton, oil at 6½ cents per gallon, labor at $4.00 per 8 hours, electricity at 3 cents per kilowatt-hour.

Assuming—Kiln burning 100 tons of lime per day at 24 hours.

Cost of Pulverizing 25 Tons Coal—Unit System

Coal for fuel	25 tons @ $8.00	$200.00
Labor	½ of 8 hours @ .50	2.00
Power	525 kw-hr. @ .03	15.75
Supplies and repairs		1.75
		$219.50
Cost per ton of lime		$2.195

Cost of Feeding 4,500 Gallons of Fuel Oil

Oil for fuel	4,500 gallons @ 6½ cents	$292.50
Labor	½ of 8 hours @ 50 cents	2.00
Electricity, steam and air		1.60
Supplies and repairs		.70
		$296.80
Cost per ton of lime		$2.968

Cost of Gassifying 28 Tons of Coal (89-per cent. efficiency of producer)

Coal	28 tons @ $8.00	$224.00
Labor:	1 man @ $4.00, 3 shifts	12.00
	1 man @ $4.00, 1 shift	4.00
Steam—Coal at $8.00		10.75
Supplies and repairs		3.50
		$254.25
Cost per ton of lime		$2.543

Powdered-Coal—Unit System

Advantages—Freedom from dust explosions. Low first cost of installation. No drying necessary.

Disadvantages — Contamination of product. Loss in calorific value in storage.

Oil

Advantages — Cleanliness. Easily handled. Low first cost of installation. No ash handling. No loss in calorific value.

Disadvantages—High price in most localities.

Producer Gas

Advantages—Gas can be utilized more efficiently. No smoke. No contamination.

Disadvantages—Loss of part of energy in coal. Stand-by loss. Most troublesome.

Many improvements have been made in the rotary kiln in the last fifteen or so years. Starting with the shell, we find that practically all shells are of welded construction. Probably the greatest advantage to the operator in welded construction is that it gives a perfectly smooth surface for the brick lining. On a check made some years ago on a 7- by 120-foot kiln it was proved that it

cost about $350.00 more to line a riveted shell than a welded one. There may have been a time when the purchaser of welded shells took somewhat a chance in buying them, but now with the development in welding technique they are stronger and better than riveted shells.

Next, tires, which were formerly solidly riveted through reinforcing bands to the shell—a source of much trouble—are now made either of the rivetless keyed type or of the full-floating type. The first design eliminates all rivets in the tire connection but, through keys or lugs, prevents the tire from revolving on the shell. In the second design the tire is also not riveted to the shell, but no attempt is made to prevent the tire from revolving. Thus the "popping" off of the rivet heads, which formerly gave the operator much trouble, is eliminated.

Third, the supporting bearings were redesigned to allow oil lubrication. The transition on bearings is rather amusing. The oldest kilns were equipped with single bearings, that is, two rollers supported each tire. They were, of course, simple bearings; in fact, they were simply grease-lubricated, babbitt-lined pedestals. Then came the so-called cradle or equalizer type of bearing, where four rollers were used under each tire and the cradles with two rollers in each were designed so as to equalize the pressure on all the rollers. They were, however, grease-lubricated, and lubricating by grease was always a problem. Now we have oil-lubricated bearings, but we have gone back to the single or two-roller type of bearing. There are several virtues in the newest type, but probably the greatest are the reduced horsepower requirements, the reduced cost of lubricants, and the lesser need for attention.

Fourth, the driving arrangement on kilns has been improved by using cut teeth in the main gear and pinion and a reducer instead of the older open type of drive gearing. Although cut-tooth gearing is more costly than molded-tooth, the life of cut teeth is longer. In to-day's practice, where oil-tight guards are installed around the main gear and pinion, the whole driving arrangement is oil- and dust-tight.

We have already spoken about the auxiliaries which are really improvements and no doubt through co-operation with the operator, the kiln manufacturer will continue to improve his equipment. One thing, however, has perturbed the writer considerably, and that is the evident

(*Continued on page 84*)

How 1943 Cement Demand Is Distributed In Various Areas

Domestic consumption of Portland cement for 1943 is estimated by the War Production Board at 107,788,000 barrels, a decrease of 39 per cent. from the 1942 figure of 177,480,000 barrels.

The estimate should furnish an approximate indication of the probable drop in requirements for sand and gravel, crushed stone and other materials used in construction.

Domestic cement requirements, listed according to the twelve Bureau of Mines reporting districts, follow:

Delaware, Maryland, New Jersey, Eastern Pennsylvania and District of Columbia—Estimated 1943 requirements are 11,165,000 barrels, or 10.4 per cent. of the national total and a decrease of 27 per cent. from 1942, when they were 15,220,000 barrels, or 8.6 per cent. of the national total.

Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island and Vermont—Estimated 1943 requirements are 11,210,000 barrels or 0.4 per cent. of the national total and decrease of 41 per cent. from 1942, when they were 18,898,000 barrels, or 10.7 per cent. of the national total.

Ohio, Western Pennsylvania and West Virginia—Estimated 1943 requirements are 8,635,000 barrels, or 8 per cent. of the national total and a decrease of 41 per cent. from 1942, when they were 14,708,000 barrels, or 8.3 per cent. of the national total.

Michigan — Estimated 1943 requirements are 3,545,000 barrels, or 3.3 per cent. of the national total and a decrease of 50 per cent. from 1942, when they were 7,130,000 barrels, or 4 per cent of the national total.

Illinois, Indiana, Kentucky and Wisconsin—Estimated 1943 requirements are 11,110,000 barrels, or 10.3 per cent. of the national total and a decrease of 48 per cent. from 1942, when they were 21,345,000 barrels, or 12 per cent. of the national total.

Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Virginia—Estimated 1943 requirements are 19,680,000 barrels, or 18.2 per cent. of the national total and a decrease of 36 per cent. from 1942, when they were 30,733,000 barrels, or 17.3 per cent. of the national total.

Iowa, Minnesota, Eastern Missouri, North Dakota and South Dakota—Estimated 1943 requirements are 3,720,000 barrels, or 3.5 per cent. of the national total and a decrease of 59 per cent. from 1942, when they were 8,974,000 barrels, or 5 per cent. of the national total.

Arkansas, Kansas, Western Missouri, Nebraska and Oklahoma—Estimated requirements for 1943 are 8,070,000 barrels, or 7.5 per cent. of the national total and a decrease of 51 per cent. from 1942, when they were 16,593,000 barrels, or 9.4 per cent. of the national total.

Texas — Estimated requirements for 1943 are 5,575,000 barrels, or 5.2 per cent. of the national total and a decrease of 51 per cent. from 1942, when they were 11,402,000 barrels, or 6.4 per cent. of the national total.

Colorado, Idaho, Montana, New Mexico, Utah and Wyoming—Estimated requirements for 943 are 3,990,000 barrels, or 3.7 per cent. of the national total and a decrease of 39 per cent. from 1942, when they were 6,551,000 barrels, or 3.7 per cent. of the national total.

Arizona, California and Nevada—Estimated requirements for 1943 are 14,878,000 barrels, or 13.7 per cent. of the national total and a decrease of 26 per cent. from 1942, when they were 20,086,000 barrels, or 11.3 per cent. of the national total.

Oregon and Washington — Estimated requirements for 1943 are 6,210,000 barrels, or 5.8 per cent. of the national total and an increase of 6 per cent. from 1942 when they were 5,840,000 barrels, or 3.3 per cent. of the national total.

New Safety Code for Quarries in Making

A great deal of progress is being made in connection with the new safety code now being prepared by a special committee appointed by the Cement and Quarry Section of the National Safety Council. At a recent meeting of this committee a number of suggestions which had been received regarding the first draft were considered. A second draft is now under way and will be available at an early date for final approval. Everything points to a code that will be useful to pit and quarry operators seeking a reliable guide as to what constitutes reasonably safe practice.

LIME-PLANT SUPERINTENDENTS

J. Gilmore Wilson, for 13 years general superintendent, Lime Division, Warner Company, De Vault, Pennsylvania.

Joseph Kochly, superintendent, Rockwell Lime Company, Rockwood (Manitowoc), Wisconsin. Started in 1908.

E. F. Alderton, since 1917 superintendent, North American Cement Corporation, Martinsburg, West Virginia.

Elmer E. Long, works manager since 1935, United States Gypsum Company, Farnams, Massachusetts.

Cecil Morris, superintendent since 1940, Batesville White Lime Company, Batesville, Arkansas.

Fred D. Jenkins, veteran of Knoxville Lime Manufacturing Company, Knoxville, Tennessee. Made superintendent this year.

Joseph Hague, Jr., general manager, Smith Lime Flour Company, Elizabeth, New Jersey.

B. P. Muldrow, superintendent, Dixie Lime Products Company, Ocala, Florida.

Superintendent McCrary, Williams, Oregon, plant, Washington Brick & Lime Company.

Gerhard R. Guse, foreman and acting superintendent, Western Lime & Cement Company, Knowles, Wisconsin.

Bayard Magee, since 1941 works manager, Bellefonte plant, National Gypsum Company.

H. B. Sullivan, superintendent, Bradley Wilson Stone Company, Franklin, Kentucky, since 1937.

R. J. Finchley, since 1928 superintendent, Diamond Springs Lime Company, Diamond Springs, California.

Gerald D. Raver, manager since 1936, Keeport, Indiana, plant, France Stone Company.

R. L. Snyder, for 16 years superintendent of The Kerns, Virginia, plant, Kimbalton Lime Company.

E. H. McEven, supervising engineer of The Chubbuck Lime Company of Los Angeles.

Dickie (*from page* 82)

lack of care, observed in many cases, used in the operation of rotary kilns. Probably because they appear to be big, cumbersome pieces of equipment, they are not treated as temperamental, with the result that many things happen which could easily be prevented.

There are a number of designs of coolers used in conjunction with rotary kilns, from the simplest, which is a rotary cylindrical shell entirely open at the discharge end, to one of the several designs of grate coolers. Rotary coolers vary mostly in the interior arrangement, since all are practically the same in outside appearance. Other types use a number of cylinders surrounding the discharge end of the kiln or a second shell around the kiln shell, the cooling being done in the annular space.

Still another design is the grate type, either horizontal or inclined, where air is forced through the bed of hot material as it progresses over the top of the grates. In all cases the hot air from the cooler is carried to the kiln as preheated air for combustion. Usually some method is used to take out of the hot air excess dust, which might prove detrimental to the proper combustion of the fuel in the kiln.

Following the cooling some plants hydrate some of or all the burned lime. For this purpose there are a number of designs of hydrators on the market. First, there are the strictly batch machines, followed by the continuous automatic batch, and finally the continuous machines. In addition pressure hydration is being done in many plants, and improvements in this, as well as the other hydrating equipment mentioned, may well be expected.

Since the experimental work which has been done in the past ten or fifteen years has made such marked improvements in both the design of machinery and operation in lime burning, we are justified in supposing that the work will be continued, all of which will redound to the benefit of the lime burner.

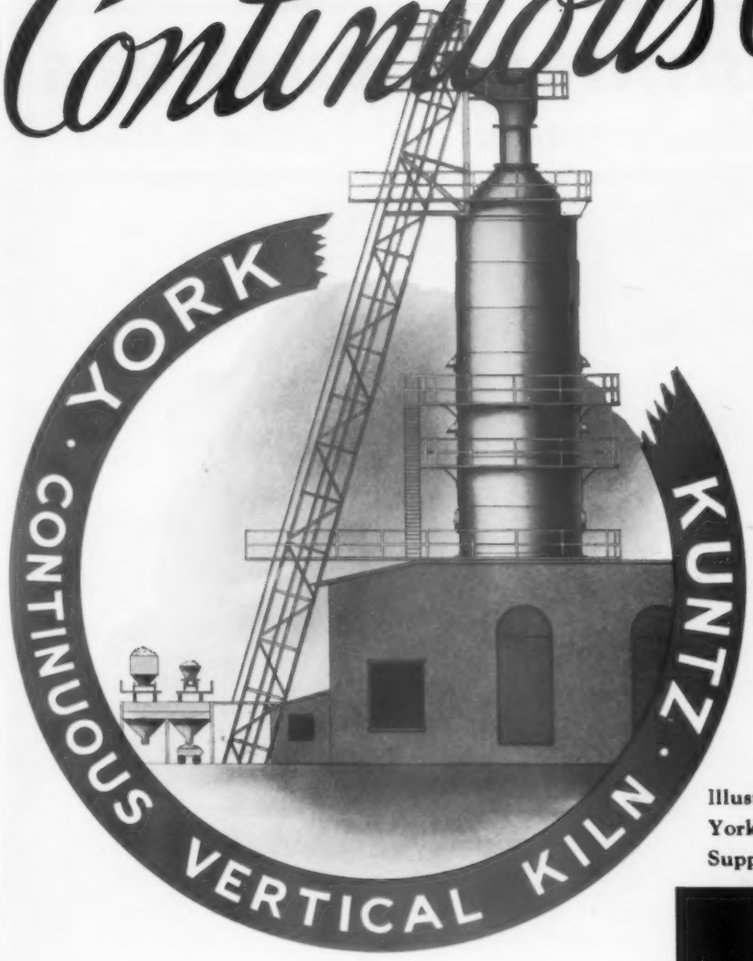
Urges Citizens Search for Quartz Crystals

Residents of the Rocky Mountain States are asked by the War Production Board to go on a "rock hunt" —with $20,000 paid for every ton of rocks.

The only catch is that the rocks must be water-clear, perfect quartz crystals. Certain crystals are badly needed for oscillators in radio sets for tanks, planes, ships and other communications equipment.

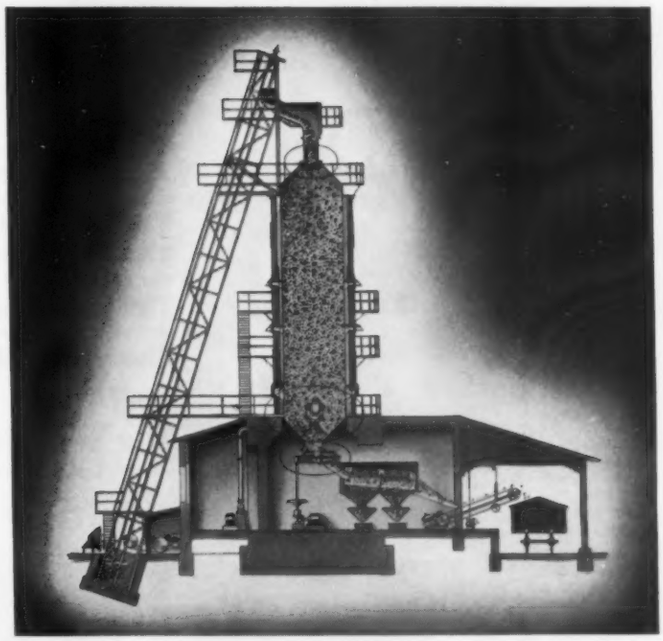
Continuous Control

IN TOMORROW'S *Automatic* LIME KILN



The York-Kuntz Automatic Kiln is engineered for tomorrow—for continuous controlled production of properly burned lime. This vertical kiln is the last word in a kiln with proper separation of delivered products, minimum interruptions for repairs and adjustments and less crushing of limestone.

Illustration shows a few of the Patented and Exclusive York-Kuntz Features: Adjustable Distributor, Center Load Support & Center Combustion Control, Continuous Discharge

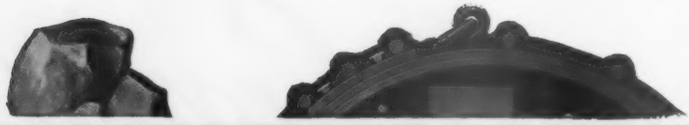


The vertical design minimizes handling, requires smaller expended horsepower, minimum of ground space and can be operated by only two men per shift.

If you want to think now about tomorrow—about more lime production, highest lime fuel efficiency with more uniformity of production and lower cost of operation—then write for full details on the York-Kuntz Automatic Vertical Kiln today!

LIME & HYDRATE PLANTS CO.

Associates **McGANN MFG. CO., INC.** *York, Pa.*



Williams Hammer Crushers

Handle Larger Rock :: 50% Less Investment :: Better Product

The "Slugger" which reduces "one-man" size limestone to 1", ¾" or agstone.

Feed opening of the "Mammoth" crusher which crushes 48" rock to 1" in one operation.

A Size for Every Job

The "Mammoth" crushes 48" rock to 3", 2" or 1" in one operation. Takes the place of a primary breaker and recrusher.

The "Jumbo" reduces 20" to 30" rock to 1¼" and smaller.

The "Slugger" crushes screen rejects or "one man" size rock to 1", ¾", ½" and finer.

The "NF" type is supreme as a recrusher for reducing 5" stone to 1", ½" or agricultural limestone.

The "Non-Clog" for crushing wet muddy rock. Cannot be clogged.

Fine Grinders • *Air Separators* • *Dryer Mills*

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We desire to take this means of expressing our appreciation to our commercial trade both domestic and foreign for their cooperation in these trying times. We deplore war and greatly prefer that the power of our organization and our products be devoted exclusively to the arts of peace. However, as in World War I, we are willingly doing our utmost for the Allied Cause.

WILL NOT PRODUCE HEADACHES FROM HANDLING OR FROM BREATHING THE FUMES FROM MUCK PILES.

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PLANTS

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Jeffrey combination pan conveyor and picking table. Handles burned lime from kiln to lime screening and crushing plant.

Jeffrey inclined bucket elevator handling kiln stone from crushing plant to storage bins. A Jeffrey steel apron conveyor handles flux stone from screens to railroad cars.

Jeffrey belt conveyors provide an uninterrupted flow of sand, crushed stone, lime, cement, etc. both in the quarry and the processing plant.

SPEED PRODUCTION
IMPROVE HANDLING METHODS

A faster way of doing the job . . . a quicker way to move materials and products. Today . . . as yesterday, the Jeffrey aim is to help you do that job better and to keep your plant modern and efficient. For high productivity . . . specify Jeffrey.

Jeffrey heavy duty bucket elevator and belt conveyor installation in a large quarry operation where high productivity is important.

Chains	Feeders	Screens
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Conveyors	Idlers (belt)	Waytrols—accurate gravimetric feeding
Crushers	Pulverizers	
Elevators	Portables	

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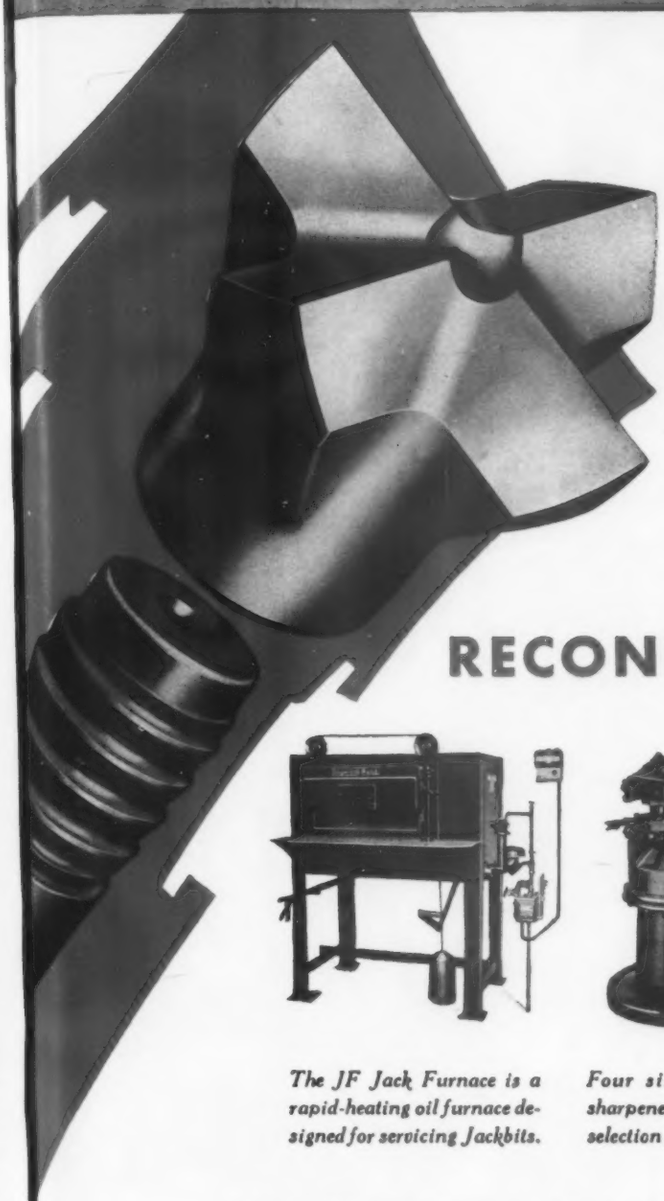
Jeffrey portable bucket loaders are ideal and inexpensive for pit to truck loading or reclaiming from storage piles. Also portable belt and scraper conveyors.

Jeffrey Waytrol below—precision unit for accurate gravimetric feeding, batching and proportioning —may be remotely controlled.

Jeffrey Pulverizer installation (below) unit being fed by a Jeffrey steel apron conveyor. Also crushers and grinders.

Jeffrey-Traylor electric vibrating 5′ wide grizzly feeder (below). Controls feed and by-passes fines ahead of primary crusher.

Another Reason Why JACKBITS Cut Drilling Costs



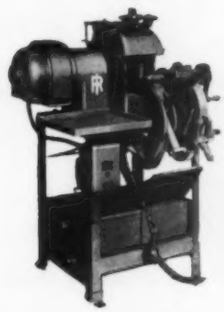
Only JACKBITS

are backed by

A COMPLETE LINE OF RECONDITIONING EQUIPMENT

The JF Jack Furnace is a rapid-heating oil furnace designed for servicing Jackbits.

Four sizes of drill steel sharpeners permit the right selection for any job.



The J3 Jackbit grinder will regrind 35 hardened or 50 annealed bits per hour.

The JMA Jackmill is a high-production hot mill that handles 200 or more Jackbits per hour.

The high output of Ingersoll-Rand Jackbit reconditioning equipment reduces blacksmith shop costs. The great degree of accuracy with which Jackbits are resharpened by this equipment permits the use of smaller gauge bits. Smaller diameter holes can be drilled faster. This speeds up the work and reduces drilling costs considerably. On one job, the adoption of Jackbits and Jackbit reconditioning equipment made it possible to reduce the starter bits for nine foot holes from 2⅛" gauge to 1¾" gauge. This reduction in bit sizes lowered the time required to drill a round 26%.

All plants of Ingersoll-Rand Company are flying the Army-Navy "E" awarded "for high achievement in the production of war materials."

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SOLVE ALL YOUR DRILLING PROBLEMS WITH IR JACKBITS

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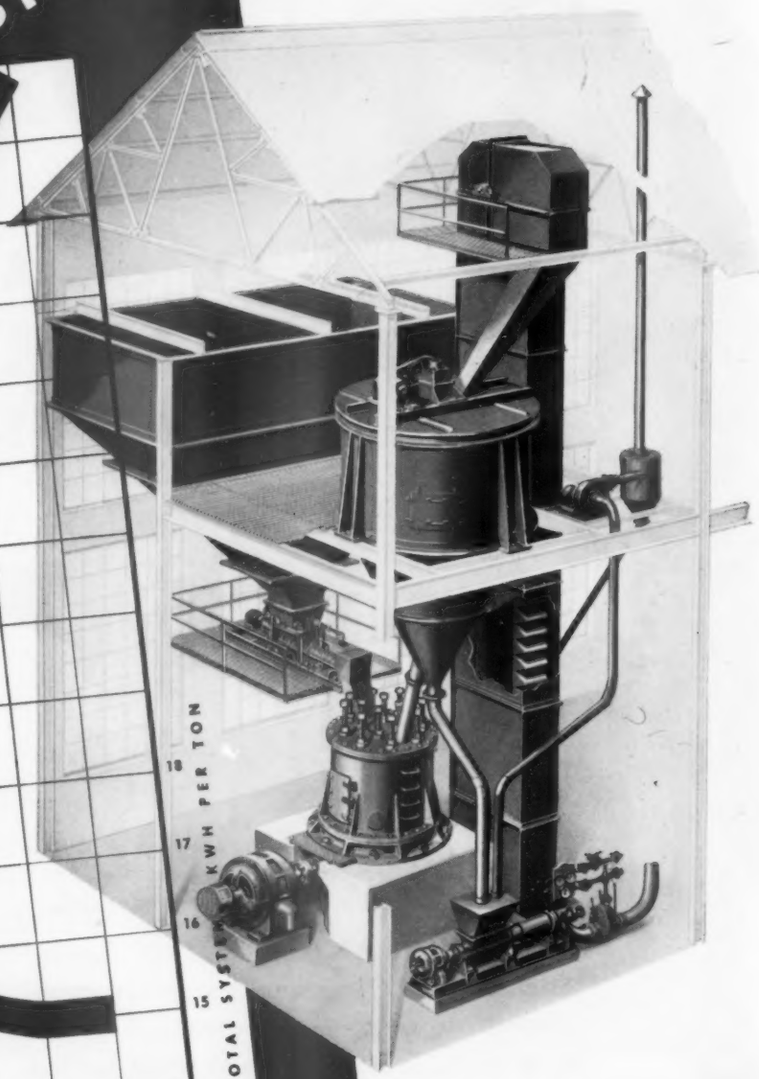
curves— tell the story



Based on actual long-time average at 55 grindability. Both drying and grinding are accomplished within the system.

Grind raw material efficiently with the BABCOCK & WILCOX Closed-Circuit System

C-50

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This wide acceptance and use of St. Regis Packaging Systems is due in large measure to the *specialized service* rendered by our engineers and field service organization. In daily relations with customers, these men have first-hand knowledge of current conditions. This intimate acquaintance with packaging operations, combined with our vast experience in the manufacture of paper bags and bag filling and closing equipment, enables our representatives to offer authoritative advice and suggestions.

As leaders in the industry we consider it our obligation to maintain continuing research and development for the betterment of paper bags and packing and closing equipment, and to be prepared to offer the *specialized service* which has established and maintained the St. Regis reputation to any manufacturer interested in exploring the economy and efficiency of paper bag packaging.

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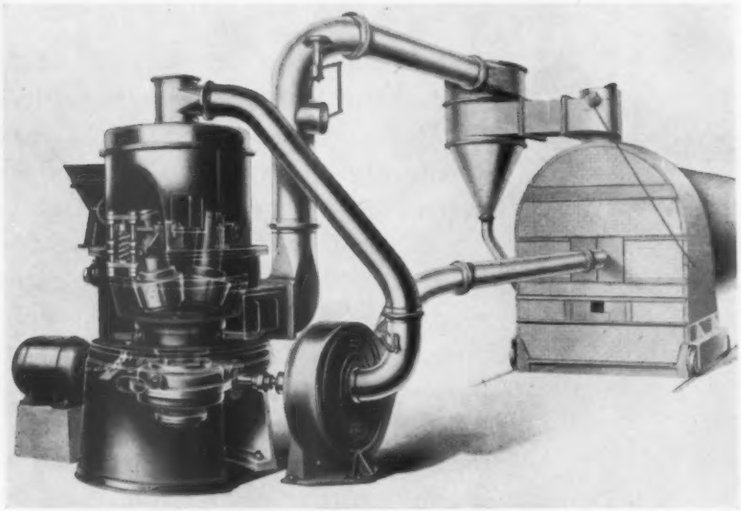
RAYMOND *Four-Star Equipment*

FIRING ROTARY KILNS with the BOWL MILL



To modernize your lime plant, begin with the Bowl Mill . . . and get maximum firing efficiency. It handles any grade or moisture coal . . . dries it in the mill . . . and maintains a uniform grind. It gives wide flexibility in control with noiseless, dustless, automatic operation, and record low maintenance.

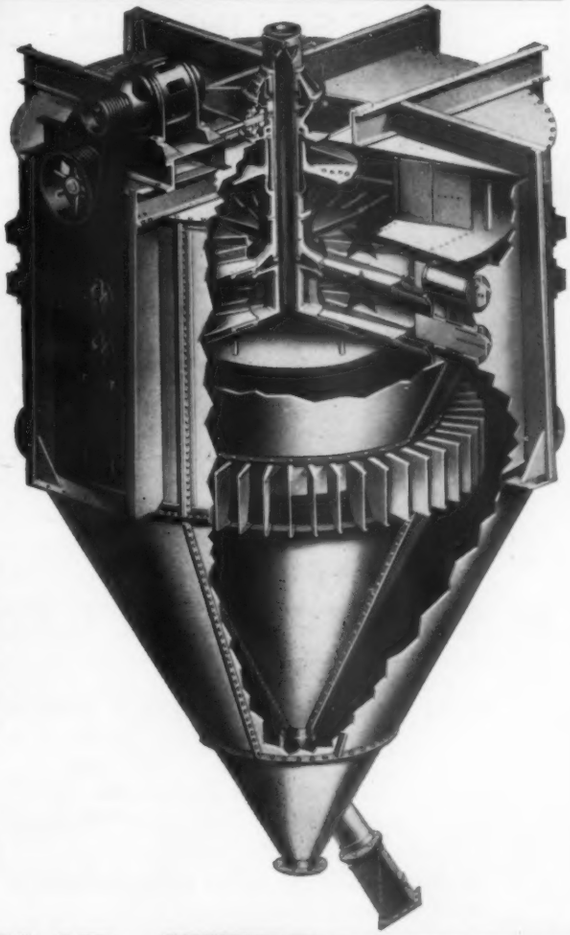
Results: Increased kiln production, superior quality lime, and big savings in fuel costs. Industry's wholehearted acceptance of the Bowl Mill is evidenced by hundreds of installations with a high ratio of more than 30% repeat orders. It's a "natural" for direct firing rotary kilns, burning lime, cement, dolomite or magnesite. *Write for Catalog No. 43.*

PULVERIZING HYDRATED LIME

For meeting today's close specifications on high purity hydrated lime, equip your plant with the Raymond Automatic Pulverizer with *whizzer separator* and *throw-out attachment.* It receives the lime from the hydrate bin, disintegrates and classifies the material, rejects the hard particles or other impurities, and delivers a uniform finished product of super quality. Changing the speed of the whizzer controls the classification and any fineness can be obtained from agricultural lime to superfine chemical hydrate, testing 99.5% through 400-mesh . . . without the loss of good hydrate. *See Catalog No. 37.*

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, Inc.

for . . . LIME PRODUCTION



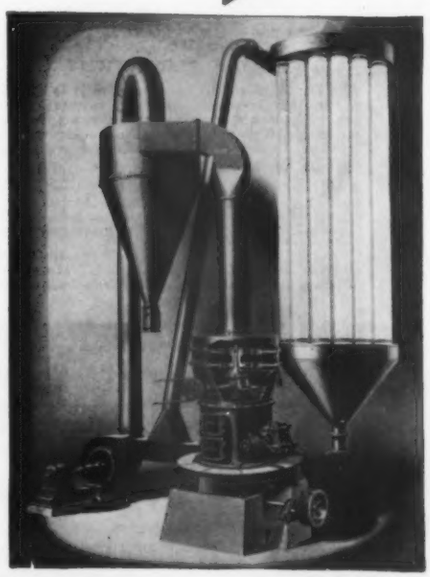
SEPARATING HYDRATED LIME

The double whizzer . . . a feature built into the Raymond Mechanical Air Separator, as indicated by red stars at the right . . . makes this machine well adapted for classifying hydrated lime, especially where you want to produce the finer grades.

You can set the Raymond Separator to take the feed direct from the hydrator, provided the lime is thoroughly hydrated, otherwise it should come from curing bins. The Separator will skim off an exceedingly high percentage of the fines, because the whizzer blades help to break up the lumpy material for easier and more complete separation. Then it discharges the oversize to an Automatic Pulverizer for further reduction and final recovery of the remaining good lime.

For further details of this operation, see Catalog No. 45.

GRINDING BURNT LIME, AGSTONE, DOLOMITE, LIMESTONE FILLERS



For heavy-duty pulverizing . . . where you want big tonnages at extremely low power costs . . . the equipment to choose is the Raymond High Side Roller Mill with the double whizzer separator, shown at the right.

First you have wide range fineness control, instantly adjustable while the mill is running . . . all the way from 60% minus 100-mesh up to 99.99% through 325-mesh, simply by shifting a speed lever on the whizzer drive.

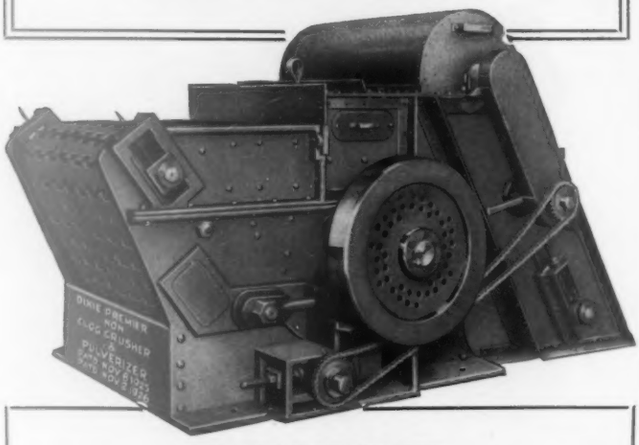
Second, you have the option of a throw-out attachment on this mill for removing impurities and refining the product. It is the standard mill for making limestone fillers, used in various industries. *Write for Catalog No. 51.*

1321 North Branch Street, CHICAGO

Sales Offices in Principal Cities • Canada: Combustion Engineering Corp., Ltd., Montreal

WHEN PRODUCTION CANNOT LAG

DIXIE GETS THE CALL!



DIXIE
Non-Clog
HAMMERMILLS

NOTE THESE TYPICAL TOUGH JOBS LICKED BY DIXIES

1. Replaced four crushers for high moisture content bauxite . . . cut power in half . . . reduced drying costs . . . increased production.
2. Efficiently crushing clay balls to reclaim phosphate in Florida phosphate plants.
3. Crushing phosphate muck in T.V.A. Tennessee plant.

HERE'S WHY . . .

The Dixie Non-Clog Hammermill is the only crusher with a moving breaker plate. Provides positive mechanical feed. No manual pushing of material needed. Even the most plastic, wet, clayey material will not slow production or clog hammers. This feature alone has saved the cost of 10 men in one company!

And because the Dixie moving breaker plate can be adjusted forward or backward from the hammer points, quality and size of production can be controlled. This feature also provides additional assurance against clogging.

These are but two of Dixie's outstanding features. Send coupon below for free booklet, "More Efficient Crushing of Raw Materials" which gives complete facts.

DIXIE MACHINERY MFG. CO.
4202 Goodfellow Blvd., St. Louis, Mo.

GET THE FACTS!

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Please send free booklet on Dixie Non-Clog Hammermills. We want to crush.....

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Company .....

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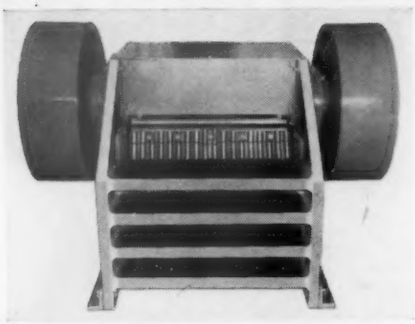
City..... State.....

Profit Platform for Producers



EAGLE CRUSHERS

EAGLE CRUSHERS, IMPACT BREAKERS and PULVERIZERS are constructed with one-piece electric welded frame.

EAGLE Jaw Crushers
Impact Breakers
Lime Pulverizers
Material Bucket Loaders

Build your cement or agstone business on a time-tested foundation — the EAGLE Roller Bearing Jaw Crusher, with a long record of super-service, durability, extra capacity and all-'round economy. EAGLE JAW CRUSHERS ranging in sizes from 10-16 to 20-36. Supplied in stationary or portable models.

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PIT AND QUARRY

Make a Better Product and Save in Cost of Lime Production by Using

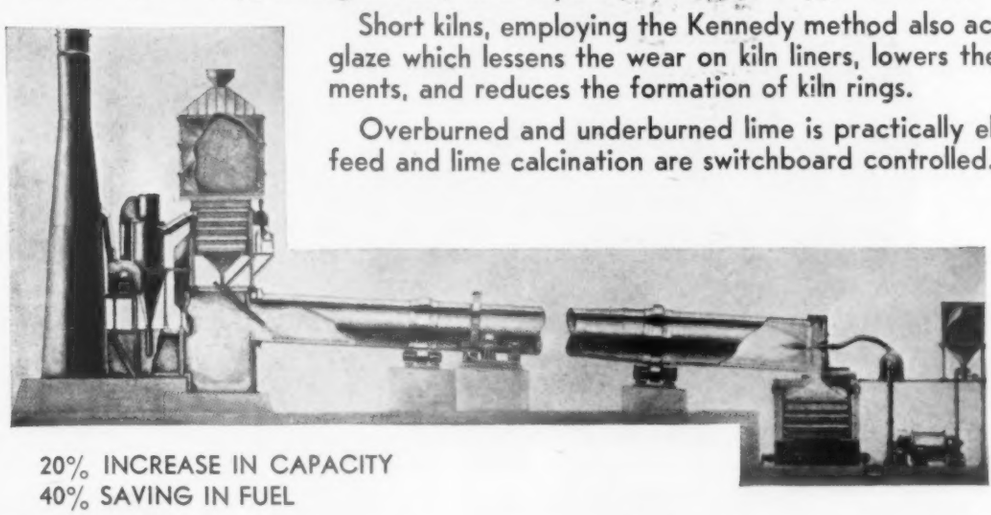
KENNEDY STONE PREHEATER, CALCINER & SOAKING PIT

It has been known for many years that better lime could be made in rotary kilns than in vertical kilns, but at a considerable handicap in price.

The great length of former types of rotary kilns, sometimes exceeding 400 feet, has failed to solve the problem of efficiently reducing the temperature of the exit gases.

Now, thanks to the Kennedy principle of preheating and deheating, it is possible to make a high-grade lime of better quality than was formerly obtainable in long or short kilns at greatly reduced cost of production.

This principle permits the effective recovery and use of the exit gases, and in actual operation has shown 40% saving in fuel, with capacity increased 20%, and more.



Short kilns, employing the Kennedy method also acquire an internal glaze which lessens the wear on kiln liners, lowers the power requirements, and reduces the formation of kiln rings.

Overburned and underburned lime is practically eliminated. Coal feed and lime calcination are switchboard controlled.

20% INCREASE IN CAPACITY
40% SAVING IN FUEL

ASK FOR BULLETINS No. 401 & 770

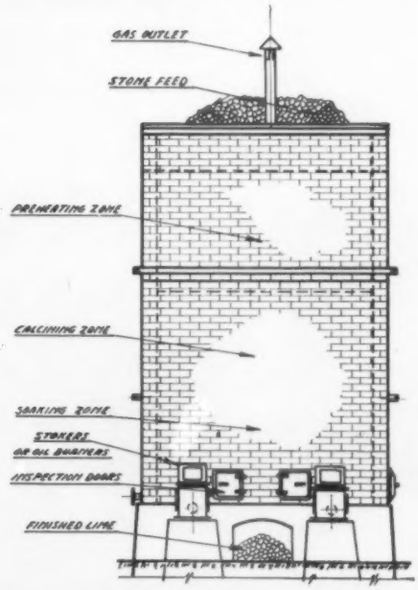
KENNEDY VERTICAL CONTINUOUS DISCHARGE KILN

We offer the Kennedy Vertical Continuous Discharge Kiln to the operator who desires to produce a better grade of lime but whose quantity requirement is too small to warrant a Preheater & Rotary Kiln installation.

This kiln is designed to calcine stone ranging in size from 3/8" to 1 1/4", thus utilizing what would ordinarily be waste for the old type vertical kiln. The kiln is simple to erect, simple to operate; can be fired with gas, oil or coal. Fuel, being thermostatically controlled, makes the kiln practically automatic and discharges continuously, producing the minimum of overburned or underburned lime.

The kiln is furnished in two sizes; 5 ton and 10 ton daily capacity.

Lower Power requirement, high thermal efficiency, high quality production.



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KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

2 PARK AVENUE — ***Complete line of equipment for lime and cement industry*** — **NEW YORK, N. Y.**

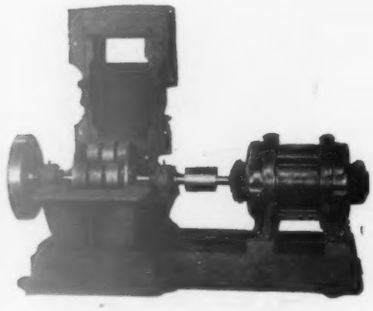
AMERICAN *Crushers*

lead the Way!

AMERICAN Hammermills are spearheading a *crushing offensive* to supply the expanding war-time demands for road-stone and aggregate.

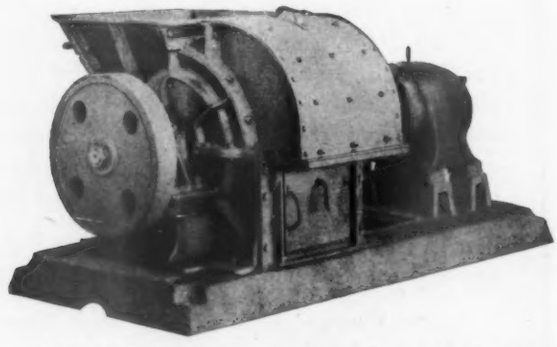
Superbly designed and built . . . *tested* by long service against the toughest opposition . . . "AMERICANS" are regarded as the "shock troop" crushers in the rock reduction field.

"AMERICANS" are in the "front line" for high capacity, product uniformity, low power and maintenance costs. Available in sizes from 10 to 100 tons per hour.



Laboratory Crushers

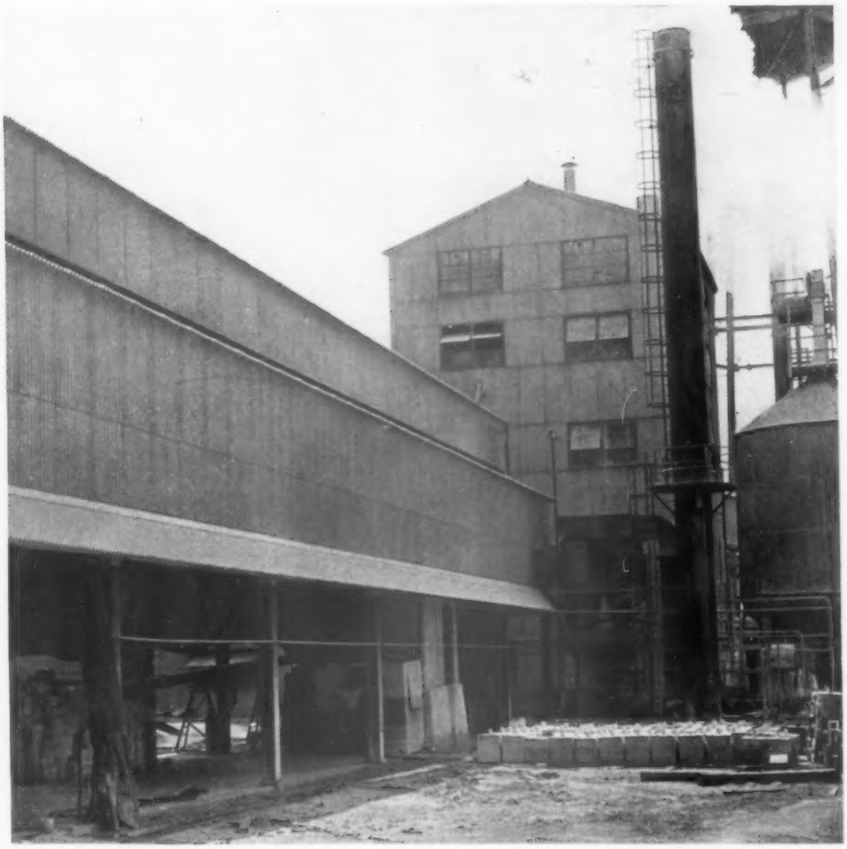
Write for Information.



AMERICAN Ring All-Steel Crusher with Metal Trap, rear view, showing heavy cast iron bedplate.

AMERICAN PULVERIZER COMPANY
1289 Macklind Ave. **St. Louis, Mo.**

Lime Recovered by Calcination from Used Pulp-Mill Liquors



Side view of kiln building and plant. At the right the cyclone-type dust-collector and stack with spray section may be seen. Causticizing building rises in background.

another ON THE SPOT report

During recent years the manufacture of sulphate pulp has become one of the leading industries of the South. One of these modern plants is that of the Brunswick Pulp and Paper Company at Brunswick, Georgia, which conforms to southern pulp-mill practice in having equipment for the recovery of the lime used in the causticizing process.

The "green liquor" (a solution of sodium carbonate and sodium sulphide) is causticized with lime to produce "white liquor" (a solution of sodium hydroxide and sodium sulphide) which is clarified and used in the digestion of the chipped wood. Upon completion of the causticizing reaction the "white liquor" with suspended solid material (mainly calcium carbonate) is passed into a 3-tray Dorr clarifier from which the clarified "white liquor" overflows and the thickened calcium carbonate mud is pumped from the bottom. This mud is mixed with water and flows to a 3-tray Dorr mud washer, from which the underflow mud is pumped to a 3- by 6-foot Oliver type filter equipped with hot-water sprays on the drum to give additional washing. The filtrate from the filter, as well as the overflow from the mud washer, is used as dilution in the preparation of "green liquor."

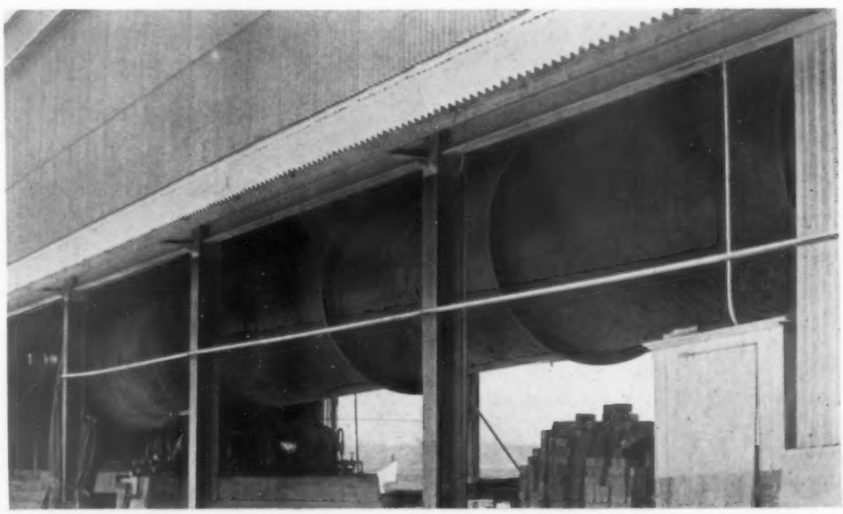
At present the sludge from the filter contains 50 to 55 per cent. solids and has less than 0.5 per cent. soda as Na_2O. This sludge drops from the filter into a screw-conveyor which discharges into a mud pump which feeds the sludge through a 4-inch line to the kiln. This is a 7- by 120-foot Allis-Chalmers rotary kiln having 21 feet of spirals and chains in the feed end to increase the heat transfer, decrease the dust loss and to give a more steady flow of the partially dry material by decreasing the tendency to form "rings". This section is lined with 4-inch bricks instead of the 6-inch size which is used throughout the remainder of the kiln.

The kiln is fired with fuel oil by an Engineer Company burner and forced draft controls. The gases pass from the kiln into a Buell cyclone-type dust-collector, through the induced-draft fan and then to the stack. A large percentage of the dust is removed by the dust-collector and much of the remainder by the sprays in the stack.

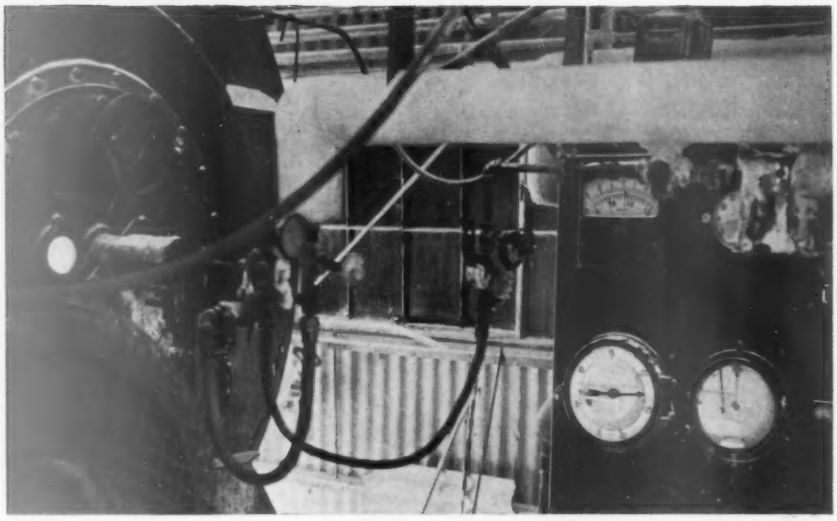
The lime is discharged from the kiln into a water-cooled drag-link type conveyor, then into a Link-Belt drag-chain conveyor. A bucket-elevator discharges the recalcined lime into a storage hopper. It is then ready for reuse in the causticizing reaction.

The kiln load varies with the thickness of the cake on the filter and is compensated for by varying the speed of rotation of the kiln. A temperature of 400 to 450 degrees F. is maintained at the feed end with 2,100 to 2,200 degrees F. at the discharge end.

The daily kiln output varies from



The rotary kiln looking toward the discharge end. Chain conveyor to storage in right background.



Part of the instrument panel and firing end of kiln, showing forced draft fan at extreme left and pressure gages on steam and oil lines leading to burner.

50 to 55 tons of lime, having a 90- to 94-per cent. availability (as CaO). Seventy to 73 gallons of oil is required to burn a ton of lime.

The operating controls include forced- and induced-draft gages, an oil-flow meter and temperature recorder-controller, a damper control and kiln (discharge- and feed-end) temperature recorders. The kiln operator keeps an hourly record of operation and tests which include draft readings, oil consumption, temperatures at the feed and discharge ends of the kiln, kiln speed, induced-draft opening, production, slaking time and the percentage of available CaO.

ment is operated one shift daily except during the spring and fall liming seasons when three shifts are worked.

The deposit is a high-grade dolomitic limestone suitable for use as fluxing stone, concrete aggregate, and for lime manufacture. This stone is loaded into trucks by a Bucyrus-Erie 120B electric shovel which has a 5-cubic yard dipper and was purchased early in 1941. The shovel formerly used in the quarry is now used for stripping. Only minor changes have been made in the crushing and screening plant which was built in 1929 and was completely described in the December 18, 1929 issue of PIT AND QUARRY. It was then one of the most modern plants of its kind in existence and still compares favorably with the best. It has a capacity of 400,000 tons annually. About one-fourth of its output is minus-¼-inch waste which is sent to the pulverizing plant.

The lime plant has six vertical kilns and a hydrating department and has a capacity of 20,000 tons annually. The lime produced is used in the glass and paper industries, for building and for agriculture. At present no finishing hydrate is made.

The waste from the screening plant consists of minus-¼-inch material. This is carried on a belt-conveyor to a 40- by 84-foot concrete-walled stock pile with a live-storage capacity of 350 tons. Under the concrete floor below this pile are three 6-foot-square tapered steel hoppers equipped with gates and Tyler electric vibrators. A 20-inch by 170-foot belt-conveyor discharges this material into the Bonnot 6- by 40-foot direct-heat rotary drier. This drier is fired with coal by a stoker and reduces the moisture content from 4 to 6 per cent. to less than ½

Mountainous Waste-Stone Pile Re-Processed, Sold at Profit

another ON THE SPOT report

The Herzog Lime & Stone Company, McVitty's, Ohio, like many other producers of crushed stone and lime, had at one time accumulated a large pile of waste fine material which could not be marketed through its usual channels. This pile contained about 100,000 tons of this material when, in 1936, a drying and grinding plant was built to produce any desired sizes of pulverized limestone. By 1939 the demand for these products had grown to such an extent that a second pulverizer was installed and a warehouse of 12,000-ton capacity was built to provide additional storage space for agricultural limestone which is in demand only during the spring and fall seasons. The original warehouse has a capacity of only 4,000 tons. The waste stock pile was exhausted late in 1941 and the plant now operates on the waste fines which result from the company's normal production of fluxing stone, crushed stone and lime.

In spite of the continued increase in the demand for these fine products company officials have not yet found it advisable to reduce stone, otherwise salable, for this purpose. Should it ever be decided to do this, however, the crushing and screening circuit could easily be adjusted for this purpose. In addition to agricultural limestone, pulverized products are sold for glass manufacture, to tire manufacturers, for dusting in coal mines, for use as artificial whiting, fertilizer filler, etc. This depart-

The pulverized-limestone building which houses the drying, storage and grinding departments. New storage building at extreme right.

of 1 per cent. at the rate of about 18 tons per hour.

A 60-foot Webster fully-inclosed chain-bucket elevator discharges the dried material on a vibrating screen equipped with 8-mesh wire cloth. The ¼- to ⅛-inch material passing over this screen drops into one of four ground-level storage compartments. Each compartment has a live-storage capacity of about 200 tons.

The minus-⅛-inch material falling through this screen is carried on a 16-inch by 50-foot Goodyear heat-resisting belt-conveyor to a Universal vibrating screen. The 8- to 12-mesh material passing over this screen drops into the second storage compartment. The minus-12-mesh material is carried on another heat-resisting belt-conveyor to a third screen which can be equipped with 20- to 30-mesh cloth as desired. The material passing over this screen drops into the third storage compartment and that passing through it is carried on a belt-conveyor to the fourth compartment.

These four materials are reclaimed from storage separately or in any desired blend on an 18-inch by 140-foot tunnel belt-conveyor. This discharges to a 75-foot Stephens-Adamson belt-bucket elevator which in turn can discharge either to bulk car- or truck-loading spouts or into the two 30-ton mill-feed bins.

Each of the two Raymond 4-roll, high-side mills is equipped with a double whizzer and a Number 11 exhaust fan and is in circuit with an 8-foot Raymond cyclone, and twin concentrators. The concentrators make it possible to use a drying circuit in the mills should this ever be desired. The product settled out by the cyclones is discharged through double valves into two 35-ton bins over two 2-tube Bates packers. Each mill has a capacity of about 8 tons per hour when grinding agricultural limestone to a fineness of 75 per cent. through 100-mesh. Most of this material is loaded into 80 pound multiwall paper bags.

The 6- by 40-foot rotary drier. Elevator to storage at right.

When the second mill was installed in 1939, an 8-foot Raymond mechanical separator was also installed so that it could be used in conjunction with the original mill circuit chiefly for the manufacture of superfine products. When this system is used, the mill is adjusted for extremely fine grinding and a screw-conveyor feeds the product of the cyclone into the separator. This discharges its fine product into a bin over a third 2-tube packer. The separator tailings are discharged to a 50-foot bucket-elevator which discharges it back into the mill or into its packer-feed bin. This material is sold as agricultural limestone.

When this system is used, about one-fifth of the mill output, or about 1 ton per hour, is a fine dust of which over 99 per cent. passes through a 325-mesh sieve. This is sold mainly to the rubber industry as a substitute for whiting. A 90 per cent. through 200-mesh mineral feed can also be made. This system has been used only in off seasons when the regular agricultural limestone demand is low.

In the last few years these special products have not been pushed and production has been concentrated on agricultural limestone. The third packer under the separator bin has been moved temporarily into the large storage building, where it is used to provide added agricultural-limestone bagging capacity. A Clark gasoline lift truck with a shovel attachment feeds the limestone to a small hopper over the packer, which is mounted on skids so that it can be moved to any part of the building.

This storage building is 60 feet wide and 504 feet long and will hold about 12,000 tons of bagged limestone. Under the present arrangement only a part of the building is used for bagged material. The remainder is used for bulk material, which can be loaded out direct or bagged to order as described above. This material is brought in from the plant in trucks which run up ramps at either end and it is hauled away for delivery in the same manner.

For additional storage capacity a lean-to has been built on one side of this building. A belt-loader and Jeffrey bucket-loader are used to store this material and to load it into trucks for shipment.

Like most other large-scale producers of agricultural limestone, this company owns a number of limestone spreaders which it rents or otherwise furnishes to its customers. This equipment includes two Baughman 105-cubic foot spreader-carriers, three International Broadcast spreaders and a Flink spreader attachment which can be fastened to the tail gate of a dump-truck.

★ ★ ★ ★ ★ ★ ★ ★
★ To keep 'em flying, ★
★ keep on buying ★
★ War Stamps ★
★ and Bonds ★
★ ★ ★ ★ ★ ★ ★ ★

Two views showing the new (left) and old 4-roll high-side mills, each equipped with double whizzers.

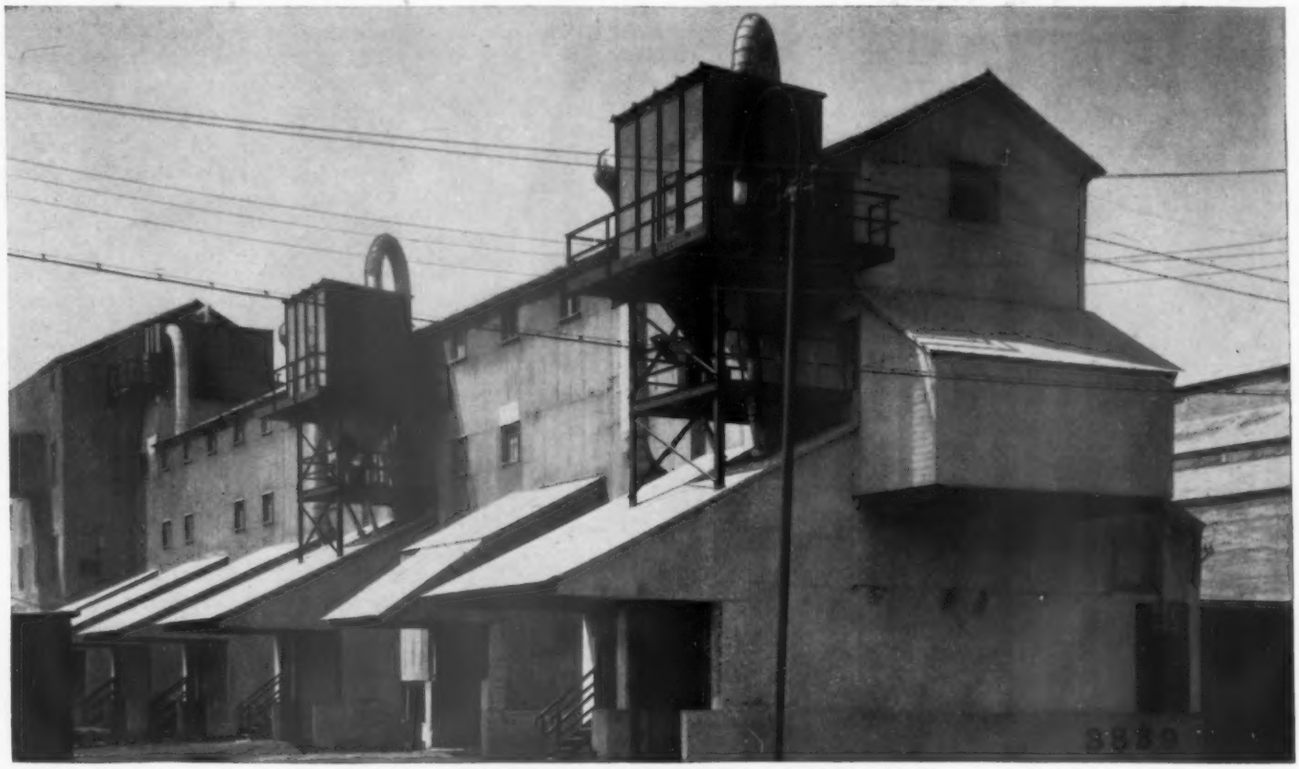
Operating Views as Caught by the Camera

This portable crushing, screening and loading plant was supplied by the Universal Crusher Company to Fond du Lac County, Wisconsin, and is being used here in a county-owned pit to supply road-maintenance material. A Northwest shovel feeds the plant hopper and power is supplied by a Caterpillar Diesel D8 tractor.

Pictured above are two views showing a blast and the resulting breakage in a quarry of the M. J. Grove Lime Company at Frederick, Maryland. Besides producing lime and crushed stone, the company also markets concrete blocks and ready-mixed concrete.

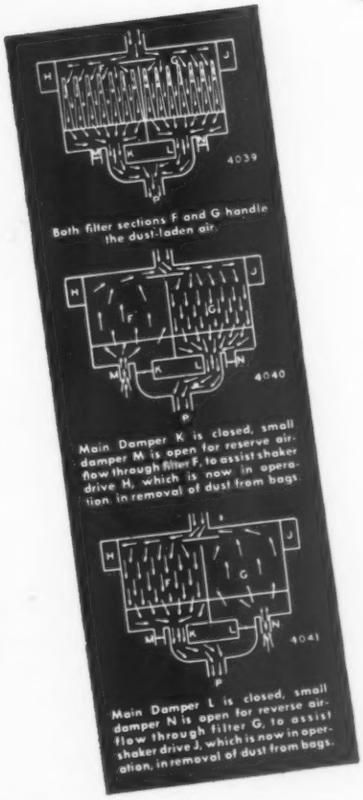
A view in the granite quarry of the Columbia Construction Company at Vail, Washington. The stone has been used largely in improving shipping facilities at Gray's Harbor, building jetties, etc. The shovels load railroad cars for transportation to the harbor approaches.

● Three Sly Dust Filters Exhausting Packing Machines and Conveyors in a large Cement Plant. This firm has a number of other Sly Dust Filters.



SLY DUST CONTROL

PROVIDES AUTOMATIC CONTINUOUS OPERATION


4039
Both filter sections F and G handle the dust-laden air.
4040
Main Damper K is closed, small damper M is open for reserve air-flow through filter F, to assist shaker drive H, which is now in operation in removal of dust from bags.
4041
Main Damper L is closed, small damper N is open for reverse air-flow through filter G, to assist shaker drive J, which is now in operation, in removal of dust from bags.

● In some industrial processes dust control must be continuous —without interruption.

Sly Dust Control Systems provide this feature, when desired, *in addition* to their regular automatic control which eliminates the human element. Details are shown in diagrams at the left.

Sly Dust Filters offer you the following *exclusive* features:

1. Greater filtering capacity because of more filtering cloth
2. Taut bags (patented) save power and improve dust removal
3. Bags more easily replaced
4. Automatic control (any degree) minimizes or entirely removes the human factor
5. Simpler shaker mechanism results in savings in maintenance and operation

Sly's long experience is at your disposal. Ask for Bulletin 98 and tell us about your dust problem so that we may write you fully.

IN THE CEMENT INDUSTRY, IT'S SLY 4 TO 1

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4745 TRAIN AVE.
CLEVELAND, OHIO

SLY
INDUSTRIAL DUST CONTROL

PERSONAL MENTION

FLOYD W. MUMMA of Decatur, Illinois has been made secretary of the Midwest Agricultural Limestone Institute, succeeding the late J. R. BENT. Mr. Mumma is connected with the Columbia Quarry Company of St. Louis.

ALPHONSE F. BROSKY has been appointed chief of the New Program Section of the Mining Equipment Division, Office of War Information, War Production Board. Mr. Brosky, who was graduated as a mining engineer from Carnegie Institute of Technology, was for many years with the Jeffrey Manufacturing Company.

MELVIN H. BAKER, president of the National Gypsum Company, has been elected a director of the Manufacturers & Traders Trust Company of Buffalo. Outstanding in business and civic affairs of the Niagara Frontier, Mr. Baker also has taken an important part in wartime and post-war planning of American industry through his membership on the Industrial Relations Policy Committee and the Post-War Planning Committee of the National Association of Manufacturers.

DICK MATTIZA, chemical engineer with the Southern Alkali Company of Corpus Christi, Texas, and Miss Josephine Barrett were married March 27 at the First Baptist Church in Corpus Christi. They went to Monterey, Mexico, on a wedding trip. Mrs. Mattiza is French and English teacher in the Corpus Christi high school.

G. W. JAMIESON, general manager of Rhodes & Jamieson, Ltd., Oakland ready-mixed-concrete producer, is in the Army serving as a captain of infantry. DONALD HEWLETT is now acting manager of the firm which produces ready-mixed concrete, for the duration. Mr. Hewlett reports they are being kept busy supplying materials for government work. It has recently been necessary to add a number of truck-mixers and other equipment.

ALLEN P. COLBY, formerly advertising manager of the oil-field division, has been made advertising manager of all divisions of the National Supply Company, Toledo.

Roy B. Rose

ROY B. ROSE has been named district manager for the H. K. Porter Company, Inc., Pittsburgh, manufacturer of industrial locomotives and process equipment, for a territory including eastern Pennsylvania, western New Jersey, Maryland and Delaware. He will be located in Philadelphia, where the company opened offices in the Girard Trust Building on April 1. Mr. Rose has been an executive of the company's process division.

GEORGE S. BARTLETT, cement-industry pioneer and widely known for his promotional work in the early days of the concrete road, was tendered a testimonial luncheon one day last March at the Union League Club in Chicago. The occasion was Mr. Bartlett's 85th birthday.

JAMES T. ESTES has been named safety engineer in charge of all accident-prevention work for the Warner Company, Philadelphia, and its affiliate, the American Lime & Stone Company. He has been with the company for several years in various capacities.

Collect dust, fly ash and other suspended particles from gases, HOT OR COLD!

They have no filters or screens to choke efficiency no high-speed moving parts to repair or replace.

They require no complicated and costly manifolding are simpler to install, easier to maintain.

They are the product of 36 YEARS of concentrated research and development in the science of recovering suspended particles from gases and liquids—starting with the first commercial application of Cottrell Electrical Precipitation...and represent a scientific solution to problems where cyclonic separation is adaptable.

Let our engineers study YOUR problem. Their wide experience in the recovery of suspended solids from gases can be of valuable assistance to you.

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ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

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WILLIAM L. BATT, vice-chairman of the War Production Board and president of SKF Industries, Inc., Philadelphia manufacturers of ball and roller bearings, has been awarded the Bok Award, a medal and a $10,000 check, not only for his service to the Nation in leading industrial mobilization of the war, but as a citizen who performed the most distinguished service for Philadelphia in 1942. This award is the twenty-first since its inception by the late Edward W. Bok in 1921.

N. R. KNOX has been made president of the Bucyrus-Erie Company of Milwaukee, succeeding W. W. COLEMAN, president for the last 32 years, who becomes chairman of the board. Mr. Knox had been a vice-president since 1933, in charge of the South Milwaukee, Erie and Evansville plants.

ROBERT H. MORSE, JR. has been named general sales manager of Fairbanks, Morse & Company. He assumes his new duties with a long and varied experience, beginning in 1916, in the service of the company and its subsidiaries more recently as assistant sales manager.

Max W. Babb

MAX W. BABB, 68, chairman of the board of the Allis - Chalmers Manufacturing Company, died March 13 in Milwaukee after an illness of several weeks. He had been board chairman since January, 1942, and the company's president for 10 years prior to that. He joined the Allis-Chalmers organization in 1904 as the company's attorney. In 1913 he was made vice-president and general attorney and he succeeded Gen. O. H. Falk as president in 1932 when Mr. Falk became chairman of the board.

E. N. VIDAL, head of the Concrete and Metals Laboratories of the United States Bureau of Declamation, died in Denver, recently. He was particularly well known in the field of concrete technology and had served the bureau for 18 years.

GEORGE H. WASSON, 89, who had been a sand-and-gravel operator at Peoria, Illinois, until his retirement 15 years ago, died recently.

A Little Metal Saves a Lot— *the Amsco Way* . . . . . .

Current uses of Amsco welding products present numerous instances where substantial quantities of critical metals have been saved, and important monetary savings effected at the same time.

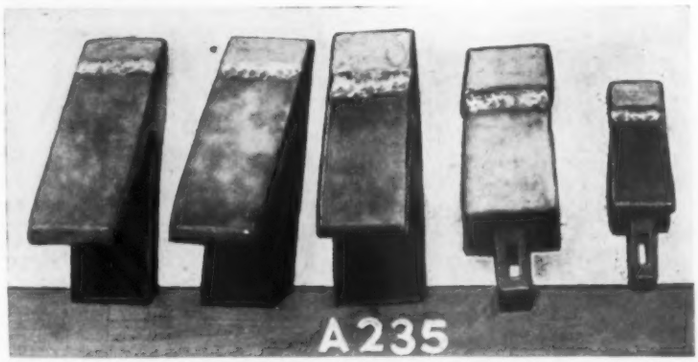
A Pennsylvania quarry forestalled rapid wear of its gyratory crusher concaves by hard-surfacing them with 1/4" Amsco Economy Hardface welding rod. This self-hardening rod is highly resistant to both impact and abrasion — much more so than the parent metal in this instance— and deposits with a Brinell hardness of 450 to 550.

The service life of the segments, one of which is shown in View A-234, was greatly increased. The cost of the hard-surfacing was much less than the frequent purchase of new and hard-to-get castings. Such applications permit the use of the more readily available metals, reducing consumption of scarce materials.

For obtaining additional service from badly worn equipment parts, such as bucket teeth, tractor grousers, dipper fronts and cutter head blades and teeth, Amsco cast repointer bars or rolled special shapes have proved effective. After using Amsco Nickel-Manganese Steel welding rod to weld on the repointer bar and fill the voids, one of the Amsco hard-facing welding rods can be applied. The dipper teeth shown in View A-235 were salvaged by repointing and hard-facing by a Canadian job welding shop — a little metal used to save a lot.

These times demand the application, where possible, of rebuilding and hard-facing to insure maximum service life from ferrous equipment parts subjected to abrasive or frictional wear.

Write for Bulletin 941-W on Amsco Welding Products.



Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois

THE AMERICAN Brake Shoe AND FOUNDRY COMPANY

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

WILLIAM E. ERDELL, 74, pioneer in the cement industry, died recently at his home in Allentown, Pennsylvania. He was formerly connected with the old Whitehall and Penn-Allen companies in an operating and executive capacity. He retired in 1926.

JOSEPH MUIR LANG, 82, founder of the Phosphate Mining Company, and a resident of Savannah, Georgia, for 58 years, died April 1. In 1906 he organized the Phosphate Mining Company, producer of Florida pebble-phosphate. He was vice-president of the company until his retirement several years ago. For 30 years he was president and treasurer of the Marion Phosphate Company.

T. WARD HAVELY, 47, president of the Central Rock Company and the Lexington Concrete Products Company of Lexington, Kentucky, died March 22 after an illness of about three weeks. He was serving his first term as mayor of Lexington, having been elected in 1939 in his first political campaign. He founded the companies which he headed in 1929.

THOMAS H. ARNOLD, 56, service engineer of the Babcock & Wilcox Company since 1934, died suddenly on March 10 in Mexico City where he was supervising a large pulverizer installation at the Mexico City plant of the Mixcoac Cement Company. He is survived by his brother, General Henry H. Arnold, chief of the U. S. Army Air Service, his widow, and four sons.

Why NAYLOR Does VENTILATING Jobs No Other Light-Weight Pipe Can Handle

No other light-weight pipe can match Naylor in push-pull ventilating service. Naylor's exclusive Lockseam Spiralweld creates a reinforcing truss which provides additional collapse strength and permits use of lighter gauge material than possible with any other pipe. This structure provides advantages like those listed here to make Naylor the preferred pipe for ventilating service.

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Always accurate in diameter.
Concentric ends match correctly.
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Holds true cylindrical form.
Stays tight and leakproof.
High salvage value.
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Sizes: 4" to 30" in diameter—all types of fittings, connections and fabrication.

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Chicago, Illinois

Legal Decisions

By LEO T. PARKER

Social-Security Lien

Failure of an employer to pay social-security, unemployment-, or compensation-insurance taxes may result in the employer's real property being sold to recover the taxes and penalties. Furthermore, it makes no difference whether or not the property is in the same county where the employer operates his business. For example, in *Commonwealth v. Reinhart Concrete Block Company*, 167 S.W. (2d) 817, the question presented to the court was: Can a state enforce collection of a lien for social-security taxes against realty situated in another county from that where the owner and employer has his principal place of business? In holding in the affirmative, the higher court said:

"The sole question is whether the Commonwealth may assert and enforce by proceedings in the Franklin Circuit Court a lien against real estate situated in another county for taxes allegedly due by a taxpayer residing and served with summons in such other county. . . . The question can only be answered in the affirmative."

What Is a Strike?

Almost all state laws provide that employees who "strike" are not entitled to receive unemployment-compensation payments from the state. Recently, a higher court broadly held that "strike" means stoppage of work.

For example, in *Princeton Mining Company v. Employment Security*, 46 N. E. (2d) 477, it was shown that certain employees stopped work while awaiting the outcome of a wage increase. They applied for unemployment compensation. However, the higher court refused to allow payments to them, and said:

"Here was a disagreement between the employer and the employees as a whole as to wages; a

demand by the employees for new and different terms, and a refusal of the employer to comply, and a refusal of the employees to work as a consequence. It was a controversy. This was a strike in the ordinary meaning of the word."

Salesmen Are Taxable

Considerable discussion has arisen from time to time as to whether salesmen are within the scope of workmen's compensation, unemployment compensation, and social-security laws. Contrary to the opinion of many modern higher courts it is unnecessary to determine whether the relation of master and servant exists between the employer and his salesmen.

For example, in *Sound Company v. Ryan*, 125 Pac. (2d) 246, it was shown that certain salesmen were employed by a company on commission. There was no definite period of employment and the salesmen could be discharged at any time. No requirement of any particular volume of sales was made necessary in order for the salesman to remain an agent of the company, or that the salesman should devote all, any portion of, his time to the business of selling. The salesmen had no drawing account and were required to pay all their own expenses.

The important question presented to the court was whether the company must pay state workmen's compensation insurance on these salesmen. The court held in the affirmative and said:

"The sole question is whether the salesmen were employees within the meaning of our unemployment compensation act. . . . It is clearly apparent that the salesmen performed services for remuneration and came within the provisions of the act. . . . We conclude that the commissions collected by the salesmen who sold stock were subject to the unemployment-compensation tax."

Validity of Easements

Modern higher courts hold that, when construing a water-easement clause in a deed, the circumstances will be considered in determining the meaning of the language used in the grant. If it appears that the intentions of the parties included a valid water easement, all others who take control of the property are bound by the validity and scope of the easement.

For example, in *Tait v. First Federal*, 28 Atl. (2d) 764, the court records show that the owner of gravel property sold land under a deed that contained a clause to the

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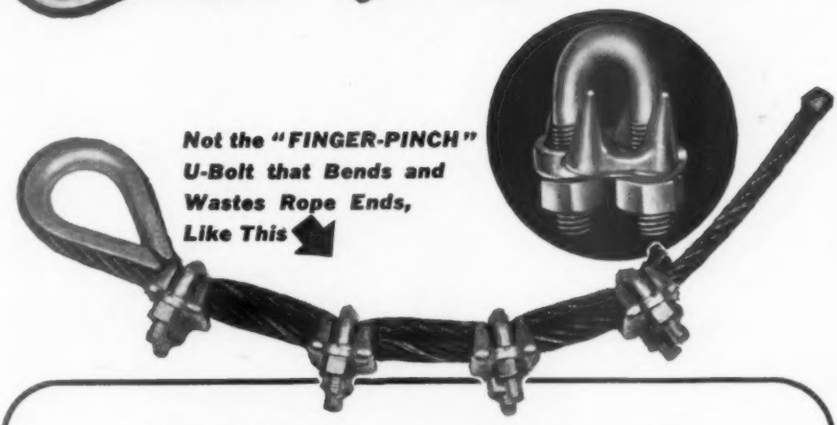
Use the "FIST-GRIP" Wire Rope Clip that Keeps Rope Straight and Strong, Like This

Not the "FINGER-PINCH" U-Bolt that Bends and Wastes Rope Ends, Like This



NOTE: The photographs of wire rope assemblies shown here are exact representations of two ¾-inch ropes fitted with recommended number of clips; all nuts on both wires uniformly tightened with indicating wrench. When "Fist-Grip" Clips are used, rope remains straight, whether or not load is applied.

Congratulations to you wire rope users cooperating with wire rope companies in Victory Rope-Saving Drive!

Laughlin "Fist-Grip" Safety Clips fit right in with your program. Don't risk wasting rope with bending, warping U-bolts.

Save war-essential metals, too. Safety Clip design, with uniform vise-like grip, delivers full rope strength with less clips. Impartial laboratory tests prove 3 do the work of 4 U-bolts.

Finally, you save both time and man-power with Laughlin "Fist-Grip" Safety Clips. Identical halves—they can't be put on backwards, even by green men—fewer accidents! Nuts on opposite sides are faster to put on and take off. Design is stronger—and those drop-forged bolts are also plenty strong. Bolt ends don't protrude, don't become battered and useless.

Save rope—clips—time—money—man-power—starting now!

THE THOMAS LAUGHLIN Company
PORTLAND, MAINE

Laughlin "Fist-Grip" Safety Clips distributed through Mill Supply Houses. Look for Laughlin Products in Pit and Quarry Handbook.

effect that the purchaser had the right to obtain water from the existing water pipes, on the land adjoining that purchased, by running pipes across the adjoining land and connecting them with such existing pipes. Pursuant to the deed, the purchaser of the land laid pipes connecting with those running from a reservoir then used as the source of supply. Two years later the seller of the property discontinued the use of the reservoir, substituting another source of water. Later a bank foreclosed a mortgage on the land on which the water supply is situated. The bank officials argued that when the original source of water was abandoned, the water easement was automatically cancelled, thereby relieving the original seller and his assignee from the obligation to supply water to the owner of the adjoining land. The higher court refused to agree with this contention.

Truck Driver Negligent

It is good to instruct all motor-truck drivers to set flares on the highway, both before and behind the truck which for any reason may be stopped on the highway at night time. For example, in *McCullough Company v. Liles*, 162 S. W. (2d) 1055, it was shown that a motor truck was left partly on a main highway. The driver of a passenger car was passing a constant stream of cars traveling in the opposite direction. The headlights of these passing cars interfered with his vision. No flares were set out by the truck driver. The driver of the passenger car collided with the truck and sustained severe injuries. He sued the company, owner of the truck, for damages. In holding the company liable, the court explained that the truck driver was negligent because no flares were set out.

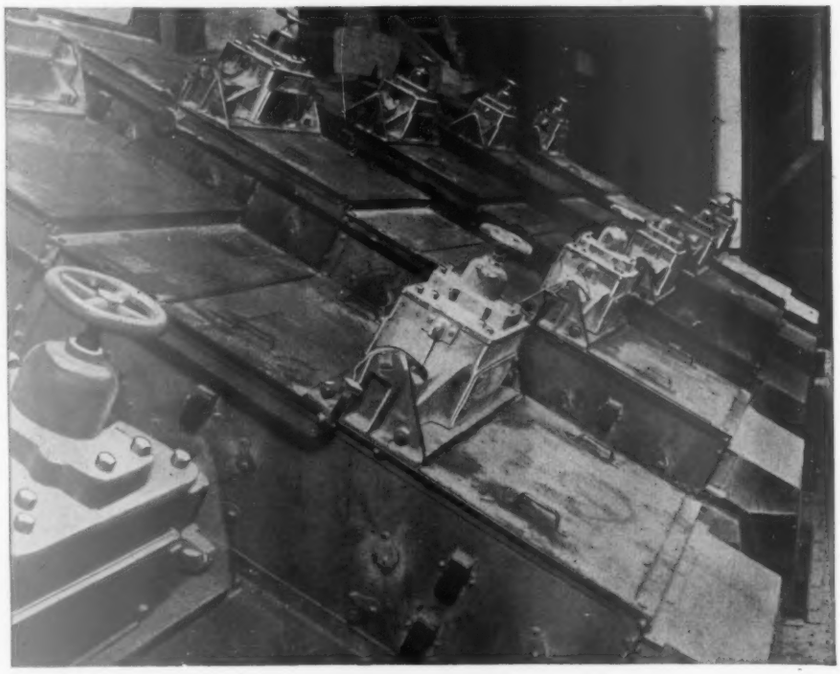
Wage Law Interpretation

Considerable discussion has arisen from time to time over the legal interpretation of the Fair Labor Standards Act. Therefore, it is important to know that modern higher courts hold that the terms with respect to merchandise used in this law—"produced" and "goods"—indicate that the Congress intended the act to apply to employees engaged in producing goods which are changed as to form by other persons before going into interstate commerce. In other words, the employee who produces goods, which form an ingredient or part of other goods which go into interstate commerce, is engaged in the production of goods for interstate commerce. Therefore, employers of these employees must pay the minimum wages specified by this law.

On the other hand, the fact that an employee is hired to perform work in a warehouse, factory, or other place, where interstate commerce business is transacted, does not result in this employee being within the jurisdiction of Federal Wage Law. For example, in *Johnson v. Great National Company*, 166 S. W. (2d) 935, Texas, it was disclosed that an employee was employed by the owner of a building where persons and firms rented space and transacted interstate-commerce business. This employee sued his employer to compel payment of back wages under the Fair Labor Standards Act. The higher court held the employee not entitled to a recovery, and said:

"We are unable to relate how an employer could be engaged in commerce when he only produced a means to produce money under rental contracts—a service establishment, for the convenience and hire of tenants. In the case at bar, no goods were produced, manufactured, mined, handled, or in any manner worked on or processed in the building."

Therefore, in view of this new de-



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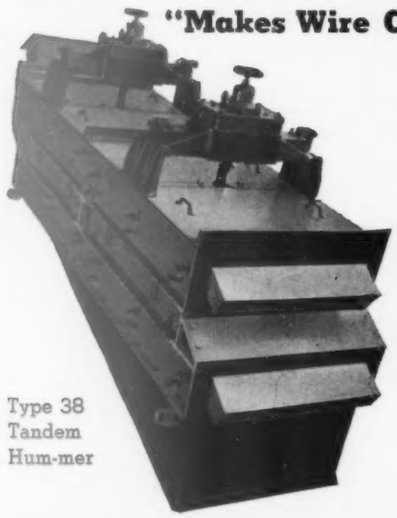

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cision it is well-established law that no employee is affected by the federal wage law unless the employer is "engaged in commerce or in the production of goods for commerce," or engaged "in any process or occupation necessary to the production thereof."

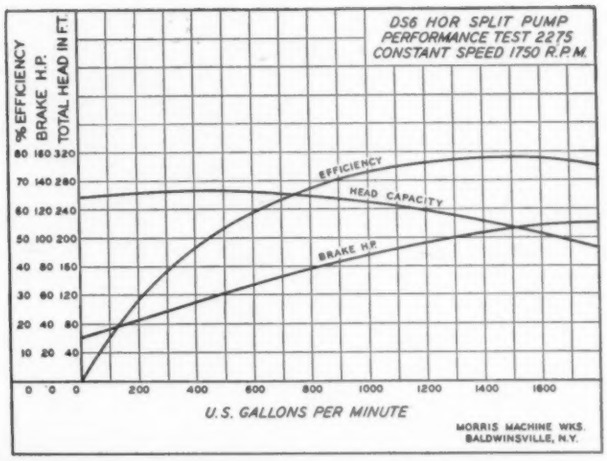
Liability for Blasting

Considerable discussion has arisen from time to time over the legal question: Is a property owner liable in damages to persons injured by blasting operations of his tenant? Last month a higher court rendered an interesting and informative decision on this point of law. Therefore, we shall review the details of this important litigation.

First, it is important to know that modern courts consistently hold that, where a dangerous condition or legal nuisance is created on land by a person other than the owner, and the owner was not instrumental in causing the nuisance directly or by his employees, he is not liable for the damages caused by such nuisance. In other words, the basis of liability which arises from the creation or maintenance of a nuisance does not depend upon the ownership or possession of the premises on which it is located.

On the other hand, it may be further explained that a property owner may be liable for the continuance of a nuisance when he has knowledge thereof, although it was created by the act of an unauthorized person. And, further, the owner of lands may be liable for a dangerous condition or nuisance on his lands originated by his tenant if *with knowledge* he maintained or permitted a continuation of it. However, where a property owner is not aware that a tenant is maintaining a dangerous condition, modern higher courts hold that he is not liable for resultant injuries to persons or property.

For example, in *Tennessee Company v. Hartling*, 11 So. (2d) 833, it was shown that the Birmingham Slag Company leased land from its owner for purpose of obtaining material by blasting operations. A pedestrian was injured when a piece of rock struck him during blasting operations. He sued the owner of the land for $20,000 damages. During the trial testimony was given which proved that the owner of the land had no information as to how the blasting was done, nor did he endeavor to acquire information in this regard. The counsel for the injured person contended that the land owner was liable because blasting is



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CENTRIFUGAL PUMPS

a legal nuisance and all property owners who lease their property are bound to know that the tenant performs no acts dangerous to other persons and property. It is interesting to observe that the higher court refused to hold the owner of the land liable, and said:

"The plaintiff's (injured person's) position is that the defendant (land owner) knew that blasting operations were being carried on on its land and for this reason there was liability for improper blasting, regardless of whether the defendant knew that such operations were being improperly done. The landlord was not charged by such fact with the knowledge of a nuisance caused by improper blasting by its tenants, or by others upon its leased premises without its knowledge or consent."

On the other hand, see the leading case of *Birmingham Ore Company v. Grover*, 159 Ala. 279. In this case the evidence disclosed that a company owned land. Its employees, while performing blasting operations, seriously injured a pedestrian who sued the property owner to recover damages. The higher court promptly held the property owner liable and explained the law, as follows:

"If a party who is blasting on his own land knows, or has reason to believe, or could by reasonable diligence know, that any one is in dangerous proximity to the place where the blasting is being done, it is the duty of the person in charge of the explosive either to use means to cover the place, so as to prevent the throwing off of material, or to give warning when the blast is about to be made, in order that those in perilous places may seek a place of safety."

Therefore, it is quite apparent that where a property owner's employees perform blasting operations, the law requires them to use at least ordinary care to avoid injuries to other persons and private property. This means that such property owner must know that his employees use the same care as, or greater care than, that which would have been used under the identical circumstances by other reasonably careful persons who are experienced in blasting.

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Questions and Answers

[Mr. Parker will be glad to answer questions regarding legal problems of PIT AND QUARRY readers. Questions should be addressed to Leo T. Parker, Legal Editor, PIT AND QUARRY.—ED.]

Legal Editor.—We know that sellers must first make delivery of merchandise from their stock to purchasers who have the higher priority rating. But if a seller depletes his stock by making deliveries to purchasers having the higher priority ratings, does this fact relieve him from fulfilling a contract previously made with purchasers who have no priority rating? We have a similar condition and the seller has advised us that he will not fulfill the contract he made with us. What are our legal rights? Please cite only high court cases, as we know many lower-court decisions are being consistently reversed.—A. S. C.

Answer.—Modern higher courts will not always excuse a seller who fails to complete a valid contract of sale on the excuse that the purchaser, who enters the complaint, has no senior priority rating.

For example, in *James Pels Company v. Republic Corporation*, 31 N.Y.S. (2d) 857, it was shown that a buyer and a seller entered into a contract of sale by the terms of which the seller agreed to supply the purchaser with a stipulated quantity of merchandise to be ordered by the

purchaser on certain dates and at agreed prices. When the times and dates for delivery arrived the seller did not fill the orders. Upon complaint registered by the purchaser the seller explained the reason for non-delivery was that the purchaser had no senior priority rating and that orders for priority rating were taken and that after such orders were filled no merchandise was in stock to fill orders or contracts previously made with purchasers who had no such high priority ratings.

However, this higher court laid down modern law to the effect that although all merchandise owned, held or controlled by the seller, or obtainable from the usual sources of supply, had been allocated to orders entitled to preference for national-defense purposes, and that no surplus was available, this condition is not sufficient to relieve the seller from damages. In other words, this court held that a seller cannot avoid liability for failure to complete a contract of sale by merely explaining that his stock was taken by firms who demanded immediate delivery and who had superior priority ratings. In order that a seller may avoid liability for failure to complete and fulfill a contract with a firm who does not hold a priority rating he must prove that he faithfully and honestly endeavored to obtain the merchandise from sources in addition to his usual sources and that he could not obtain the merchandise.

Legal Editor.—We use considerable gas for various purposes. The state authorities contend that we must pay a "sales" tax on gas taken from a pipe line which conveys gas interstate. Are we liable for payment of this tax?—C. W. S.

Answer.—It is a well-established law that as long as gas, or other imported merchandise, remains in the hands of the importer in the original and unbroken package in which it was imported, it is protected by the Commerce Clause of the Constitution from interference by state taxation laws. Therefore, it is only when the original package has been sold by the importer or has been broken by him, or has otherwise become mixed with the common mass of property in the state, that it becomes subject to state legislation. This rule of law is applicable in determining whether gas is subject to a state's sales tax.

For illustration, in *Mississippi River Fuel Corporation v. Smith*, 164 S.W. (2d) 370, a gas company was authorized to do business in Missouri. It operates a 22-inch pipe line from Louisiana, through Arkansas and into Missouri. In the distribution and sale of gas to industrial consumers located on the main transmission line in Missouri each delivery is affected by a small lateral line taking off from the main line. Within a few feet of the main line regulators are placed upon the lateral line to control the passage of gas into the latter. These regulators effect a substantial reduction in pressure from the main line to the lateral line and allow only that amount of gas to pass into the lateral line that is necessary to make available an adequate supply of gas for industrial use. No doubt you obtain your gas from the interstate transmission, or pipe line, as this is usual practice.

The higher court held that the gas used in Missouri is subject to sales tax in Missouri. The court explained that this is the law under the old "broken-package rule", which subjects articles imported in interstate commerce in their original packages to state taxation when the importer sells or breaks the package. Therefore, sales to industrial users, like yourself, of gas transported in interstate commerce by a pipe-line are subject to a state sales tax. More-

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over, if the pressure is reduced before the gas reaches your branch line, and the gas in such branch lines is not returnable to the main line, you must pay the "sales" tax for all the gas which enters the branch line.

* * *

Legal Editor.—We employ a watchman who is old and who is not physically fit; in fact, we keep him because he has been with our company for so many years. Only a small part of our business is interstate. Anyway we believe that the watchman is an "intrastate" worker and we are not paying him the regular wages specified by the federal wage law. Can it be possible that in the future we may have trouble over paying this employee on a low wage scale?—A. G. G.

Answer.—According to decisions rendered by recent higher courts, if an employer operates at least one branch of his business exclusively in interstate commerce, he must pay all his employees the wages specified in the Fair Labor Standards Act. And this is so, even only a small percentage of the employer's business relates to interstate commerce.

Later higher courts have held that the term "commerce," as used in this federal wage law is defined to mean "trade, commerce, transportation, transmission, or communication among the several states or from any state to any place outside thereof." The law further provides that "an employee shall be deemed to have been engaged in the production of goods if such employee was employed in producing, manufacturing, mining, handling, transporting, or *in any other manner working* on such goods, or in any process or occupation necessary to the production thereof in any state."

For example, in *Niehaus v. Joseph Greenspoon's Corporation,* 164 S.W. (2d) 180, it was disclosed that a night watchman sued a corporation to recover an unpaid balance allegedly due him, after deducting the compensation actually paid him from the total amount he was entitled to receive at the federal statutory minimum wage of 25 cents an hour with time and one-half for the hours employed in excess of 44 hours a week. He alleged that his employer owed him, as this difference, the amount of $365 under the Fair Labor Standards Act. During the trial the night watchman proved that his employer was engaged in a manufacturing business and that 25 per cent of his products were shipped in interstate commerce. In holding in favor of the employee the court said:

"Under the facts of the present case, the plaintiff was 'engaged in commerce or in the production of goods for commerce' within the scope and application of the act."

Also, other courts hold that if an employee works only one hour each week on interstate-commerce goods, the employer must pay him wages for the full week under the law.

In view of these decisions you must pay your watchman the wages specified by the Fair Labor Standards Act.

* * *

Legal Editor: Recently we had in our employ a workman who we thought was guilty of a theft. The police came in and later took his picture which was placed in the rogue's gallery. Now, this employee is suing us for damages. Are we liable in your opinion, and can you give us higher court cases in our favor?—E.M.C.

Answer: The courts recognize that convicts and hardened criminals may forfeit all their legal rights and that their pictures may be taken and displayed to assist in crime prevention. On the other hand, it is illegal according to modern higher courts for any one to make and publish pictures of a person accused but *not* convicted of crime. For example, in

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42 So. 227 it was disclosed that a suit was filed against the inspector of police who directed a photographer to take a person's picture and place a copy in the rogue's gallery. The person who filed suit proved that he was entitled to recover heavy damages because, although he was arrested for having received stolen goods, he was tried and discharged from court. In holding the inspector liable in damages, the court said:

"It remains that the plaintiff (subject) does not appear before us as one who has been convicted of crime. It is true that the inspector is authorized by law to take such measures as are needful to prevent crimes, to detect and arrest offenders, and to protect the right of persons and property. The necessity for taking the picture is not apparent, there being no evidence of any conviction of the plaintiff either in the courts of this state or any other state. Nor is there evidence before us that it is important for his identification that his photograph be taken."

However, it is my opinion that you are not liable because only the police officials have a legal right and authority to place photographs in the rogue's gallery. On the other hand, see the leading case of 39 So. 499. In this case the higher court said:

"Where a person is not guilty, is honest, he may obtain an injunction to prevent his photograph from being sent to the rogue's gallery. There can be no public good served by taking the photograph of an honest man for the purpose before mentioned."

* * *

Legal Editor: Please state the law with respect to the legal effect of a printed notification on a letter head or order form. A few days ago I received a letter from a dealer which described a used machine as "in excellent condition." The letter stated "we offer this machine to you at $1,500. Please accept our offer by return mail if you are interested."

At the top of the letterhead was printed the notification: "All quotations subject to change without notice, and to goods being unsold."

We answered this letter at once and accepted the offer sending our check for deposit. Several days later we received a letter from the seller calling our attention to the printed notification, and inclosing our deposit check with the information that the machine had been sold to another party before our letter was received. Have we any right of action against this firm?—T. R.

Answer: Under the circumstances you mention you have a legal right to compel the seller to deliver the machine or pay damages, particularly for the reason that he made you an absolute offer to sell the machine. If, however, he had directed your attention to the printed notifications or had explained that the offer was being made subject to the machine being unsold when your order was received, you would have no right of legal action.

The law is well established that a printed statement or notice on a contract, bill head, bill of lading, or letterhead is not effective, particularly if the printed statement is contradictory to the statements contained in the body of the contract or letter. Moreover, it has been held that a stipulation printed in small inconspicuous type is not effective, unless referred to in the body of the letter or contract. In a leading case (64 S. E. 553) a contract of sale contained the printed notification: "All agreements are contingent upon strikes, accidents, and other delays beyond our control." Due to the impossibility to obtain raw material the seller could not deliver the merchandise. The buyer sued to recover damages, because he was compelled to buy the goods elsewhere at an advanced price. The seller defended the suit on the con-

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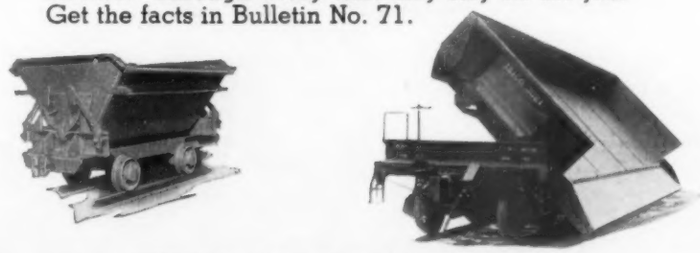

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tention that the printed notification relieved him of liability for failure to fulfill the contract. However, the court held the seller liable in damages, saying:

"If a contract in writing is plain and clear and unambiguous in its terms, *it is not subject to modifications by a statement in a letterhead, printed at the top of the paper*, which is not incorporated into the contract and is inconsistent with it. Even where a printed form of contract is used, but terms are written into it which are variance with the printed matter, the writing will control."

Also, in another case (126 Ill. App. 253) a seller wrote a purchaser that, until otherwise advised, the price of merchandise for future orders would be $2.50 per ton. The seller's letterhead contained the printed notice: "Quotations not binding until orders are accepted and are then subject to all contingencies beyond our control, advances in mining or rates of transportation."

The buyer immediately ordered several cars of the merchandise, but in the meantime the manufacturing company's cost advanced and the seller attempted to increase the quoted price. However, the court held the buyer not bound by the printed notice. Also, see other cases as follows: 124 S. W. 1107, 233 Fed. R. 704, and 246 Pac. 332.

The only conditions under which a printed notice on a letterhead, bill head, order form, etc., is valid is when the notice does not in any manner conflict with the terms stated in the body of the letter or contract. In other words, a seller can not positively offer merchandise at a definite price and then rescind the contract. The courts take the stand that the buyer is legally bound when he accepts an offer or signs a contract, and so also the seller is obligated to the same extent irrespective of printed notifications.

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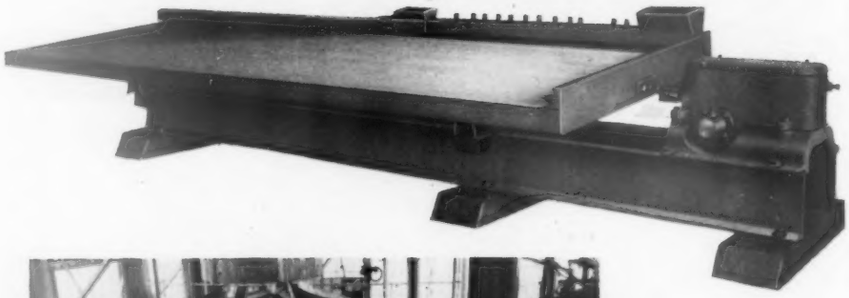

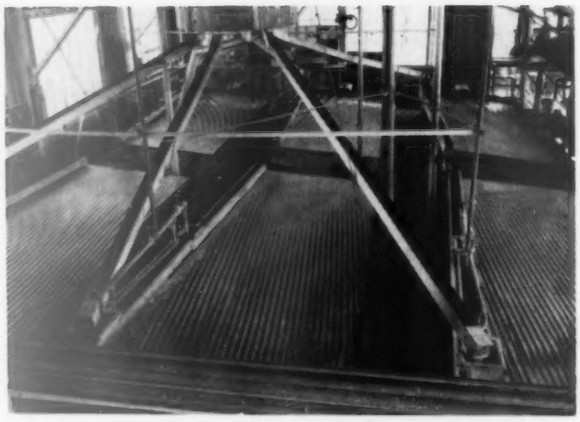

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Trade News

Award of the company's 50-year medal to L. N. Aller, secretary-treasurer, brought to fifteen the number of men now living who have been employed by the Taylor-Wharton Iron & Steel Company for fifty years or more, George R. Hanks, president, has announced. Organized in 1917 on the occasion of the company's 175th anniversary, the 50-year Club has had a total of 42 members. Of the 15 now living, 11 are still in the employ of the company while the other 4 have retired.

The board of directors of the Hercules Powder Company has elected Edward B. Morrow as a vice-president, and named Francis J. Kennerley to succeed Mr. Morrow as treasurer of the chemical company.

TRAFFIC News Digest

I.C.C. Reports

Roasted Calcite.—I. and S. No. 5050. Roasted calcite, West Virginia and Ohio to Official Territory, embracing No. 28666, Ohio Calcium Company, Inc. v. B. & O., *et al.* Proposed increased rates on fluxing materials, in carloads, described as ferro-calcite from Lawrence, Ohio, and as roasted calcite from West Virginia origins, to steel-producing points in official territory, found reasonable, but maintenance of such rates with continued maintenance of certain rates on fluxing lime from

competing origins to the same destinations on a lower level would constitute undue preference and prejudice. Suspended schedules were ordered canceled on or before April 27 without prejudice to the establishment of rates in accordance with the views expressed in the report. The report stated that it did not appear that a level of rates lower than 80 per cent. of the lime basis proposed would be unlawful if maintained from all competing origins. The complainant took the stand that the 80 per cent. basis was unreasonably high and, at the request of the complainant, the commission dismissed, without prejudice, the complaint in No. 28666 attacking rates on ferro-calcite from Lawrence, Ohio to steel producing points in official territory.

Cement.—Docket No. 28680. Monolith Portland Cement Co. v. A. T. & S. F. *et al.* By Division 2. Dismissed. Rates on cement, in carloads, from Colton, Crestmore, Monolith, and Victorville, California, to Phoenix, Arizona, and points taking the same rates found not shown to be unreasonable, or to subject complainant at Monolith to undue prejudice, or to give undue preference to producers at Colton, Crestmore, and Victorville. According to the report, the complainant desired a rate from Monolith to the Phoenix area not exceeding the rates applicable from competing mills at the other origin points. It was pointed out in the report that the rates from the origin points were the same until the institution of plant-facility trucking operations from Crestmore and the fear that such service would be inaugurated from Colton and Victorville brought reductions from 23 to 22 cents from Monolith and from 23 to 19 cents from Colton, Crestmore, and Victorville. These rates were reduced effective May 25, 1941, the same date that plant-facility trucking from Crestmore was discontinued. The report stated that it appeared that the 1-cent reduction in the complaint's rate placed it in a better position than it was when the traffic from Crestmore was moving by motor vehicle and added that the cost records indicate that the cost of trucking from Monolith to Phoenix would be at least 3 cents more than from Crestmore, Colton, and Victorville to that point.

Mineral Wool.—I. and S. M-2139. Mineral wool, South Plainfield to Connecticut, Massachusetts and Rhode Island. By Examiner W. T. Cantrell. Commodity rates on mineral wool from South Plainfield, New Jersey, to points in Connecticut, Massachusetts and Rhode Island, proposed to be found not unreasonable or otherwise unlawful, order of suspension vacated, and proceedings discontinued. By schedules filed to become effective November 25, 1942, by Eastern Motor Freight Lines, Inc., and suspended until June 25, 1943, on protest of New England Motor Rate Bureau, Inc., and of New England Freight Association, Eastern proposed to establish a rule that when a less-than-truckload shipment filled a vehicle the charges would be computed at the less-than-truckload rate and on a weight of 10,000 pounds, unless the charges on a truckload of the same commodity would be less, in which event the latter charges would apply.

Motor Reports

Washington, New Jersey—MC 104215. Albert and Ethel Damelio, contract carrier. Dismissal proposed at applicants' request. Brick and kindred materials, including tile and cement blocks, from Port Murray, New Jersey to points in New Jersey, New York and Pennsylvania, and

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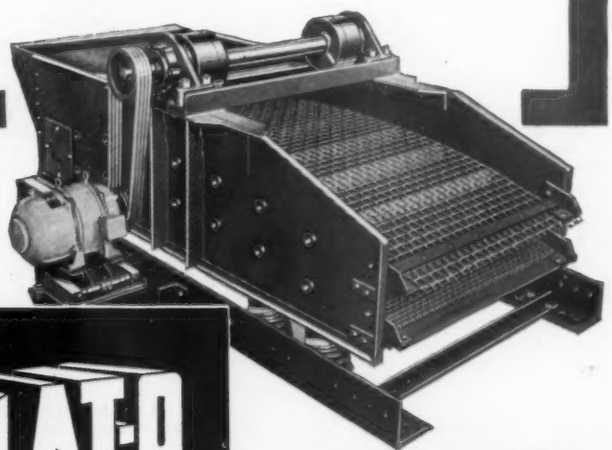

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fire brick, brick-making machinery, washed sand and gravel on return movements.

Imperial, Nebraska — MC 91678. Sub. 1, Lyle Mendenhall, extension. Denial of certificate proposed. Cement, plaster and building materials in Colorado and Nebraska.

Fall River, Massachusetts. — MC 104168. Alfred C. Dawson, common carrier. Certificate proposed. Sand, gravel, excavated materials, crushed stone, tar, asphalt, cement, and other road-surfacing materials between points in a described area of Massachusetts and Bristol, Kent, Newport, and Providence Counties, Rhode Island, and North Kingstown Township of Washington County, Rhode Island, over irregular routes.

Freight-Rate Increase to be Cancelled. — Newspaper releases dated April 13 stated that the commission, by a 6 to 5 vote, had revoked its year-old authorization of the average 6-per cent. increase in freight rates. The reopening of the rate case resulted from complaints of former Price Administrator Leon Henderson and Economic Stabilization Director James F. Byrnes that the increases had an inflationary effect on the national economy. Complaints had also been made by the Agriculture Department and shippers.

The commission did not support the OPA contention that the rates were inflationary, but justified its decision by the fact that railroad revenues had increased to such an extent through an upward swing in the amount of freight being handled that the increases no longer were necessary in order to enable the carriers to meet additional wage and operating costs resulting from the war.

Central Freight Association

Docket 73119. (Carrier's proposal).—Gravel, in open-top cars, carload. Establish a rate of 55 cents from Phalanx, Ohio to Kent, Ohio. Subject to Ex Parte 148 increase.

Docket 73122. (Shipper's proposal). — Limestone, agricultural, unburned (not ground or pulverized) in bulk, in open-top cars, carload. Establish a rate of $1.60 per net ton from Genoa and Martin, Ohio to Cadiz, Ohio, *via* N.Y.C.(W)-Toledo, O.-P.R.R. Subject to Ex Parte 148 increase.

Docket 73124. (Shipper's proposal). — Limestone dust, unburned, carload. Minimum weight 90 per cent. of the marked capacity of the car, except that when the cars are loaded to their full visible or cubial capacity, the actual weight will apply. Establish a rate of $1.76 per net ton from Speed, Indiana, to Cincinnati, Ohio. Subject to Ex Parte 148 increase.

Docket 73154. (Shipper's proposal). — Industrial sand, amend N.Y.C. Tariff 1908, naming rates on, from Vassar and Watrousville, Michigan, to various destinations in C. F. A. territory, by providing for the addition of Millington, Michigan, as an origin point at the same rates as now in effect from Waterousville and Vassar, Michigan.

Docket 73157. (Shipper's proposal). — Lime, common, hydrated, quick or slaked, carload. Establish rates of 16 cents minimum weight 30,000 pounds, 13 cents minimum weight 50,000 pounds, from Wyandotte and Detroit, Michigan to Ceico, Ohio. Routing guide routes. Subject to Ex Parte 148 increase.

Docket 73243. (Carrier's proposal).—Crushed stone, crushed-stone screenings, in open-top cars, carload, minimum weight 90 per cent. of the marked capacity of the car except that, when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish a rate of 66 cents per net ton from Hite and Marble Cliff, Ohio to Canal Winchester, Carroll, Groveport, Hookers, Lancaster, Lockville and Valley Crossing, *via* P.R.R.—Columbus—C.&O.

Docket 73027. (Shipper's proposal).—Sand, except blast, core, engine, filter, fire or furnace, foundry, glass, grinding, ground, loam, molding, bonded naturally or otherwise, polishing, pulverized or silica, or gravel, in open-top cars. Establish a rate of $1.71 per net ton from East St. Louis, Illinois to Wabash, Indiana. Also establish a rate of $1.32 per net ton from Terre Haute, Indiana, to the same destination. *Via* N.Y.C. Subject to Ex Parte 148 increase.

Docket 73126. (Shipper's proposal). — Agricultural Limestone, unburned, not ground or pulverized, in bulk, in open-top cars only, carload. Establish a rate of $1.05 per net ton from Narlo, Ohio, to Huntsville, Ohio. From same origin a rate of $1.10 per net ton to Big Springs and Lippincotts, Ohio. Subject to Ex Parte increase.

Docket 73050. (Shipper's proposal).—Brucite and dolomite combined, calcined or dead burned, carload. Minimum weight 60,000 pounds. Establish a rate of 36 cents from Bettsville, Maple Grove, and Narlo, Ohio to Duluth and Steelton, Minnesota.

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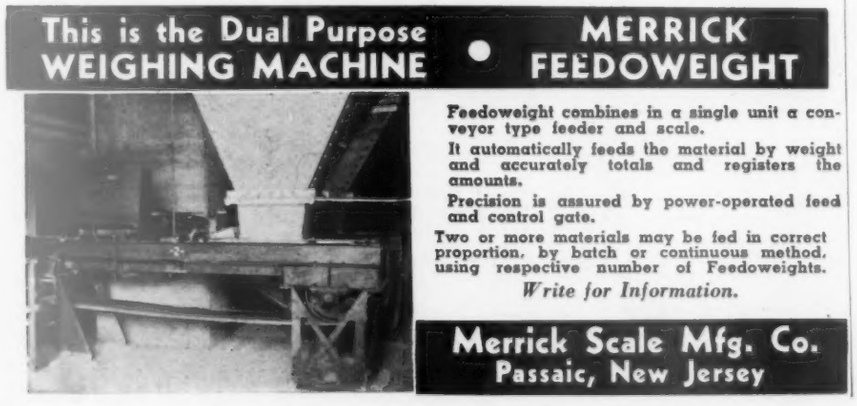
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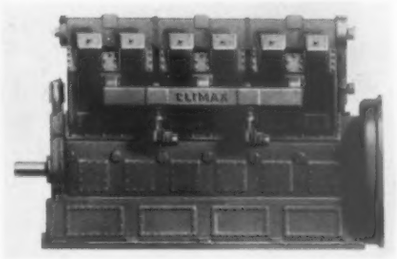
NEW MACHINERY and SUPPLIES

● Power Unit

The Climax Engineering Company announces its new V-12 Blue Streak engine, the latest addition to the extensive line of the company's engines and engine-generator sets.

With a normal speed range of 600 to 1200 r.p.m. and a brake horsepower of 435, the new V-12 is said to meet today's demands for a high-speed engine which will mesh with modern power consuming



The 12-cylinder engine which operates on gasoline, butane, natural or sewage gas.

machinery for rock or oil drilling, operating large pumps and compressors, driving mining and construction machinery and, with suitable generators, a low cost means of generating electric power.

Standard design features include wet cylinder sleeves, seven-bearing crankshaft, overhead valves, aluminum (5-ring) pistons, rifle-drilled connecting rod and fuel change-over devices. Where required, the company will furnish a complete range of accessory equipment such as starting devices, air cleaners, filters, radiators, heat exchangers, etc. All of these may be selected to meet the specific needs of the particular installation.

For more complete information, specifications, test data, recommended applications, write to the Climax Engineering Company, Clinton, Iowa.

● Scraper

A new scraper has been designed by the Huber Manufacturing Company, Marion, Ohio, to meet the need for a versatile small scraper unit for pit, quarry and construction service. The Speed Scoop, as it is known, can be brought into action by only attaching it to a tractor. It is claimed that the machine is three to six times as fast as larger scrapers and requires but one man to handle it efficiently. Loading is accomplished with an easy rolling

The tractor-drawn scraper.

Part of a rush order of 400 Chevrolet trucks converted to heavy-duty units with Thornton-four-rear-wheel drive and 5-cubic-yard dump-body chassis. They are to be used by the Part of a rush order of 400 Chevrolet trucks converted to heavy-duty units with Thornton

movement of the earth, which produces draw-bar pull. A simple hydraulic cylinder controls the scoop and its blade adjustment to the earth. The hydraulic ram action makes it possible to dump the material in one pile or spread it to any desired thickness, and backfilling, shouldering operations, dumping in odd corners or over embankments can be done with a full measure of accuracy. It is built in two sizes, for operation with 20- to 30-horsepower tractors, or 35- to 50-horsepower tractors.

● Skin Cream

Finely-ground vermiculite is being used by the Alexite Engineering Company of Colorado Springs in a skin-protecting cream being marketed by the company for the prevention of industrial dermatitis. The flake-like, micaceous particles are said to cover the skin "like scales on a fish" and prevent irritations from developing.

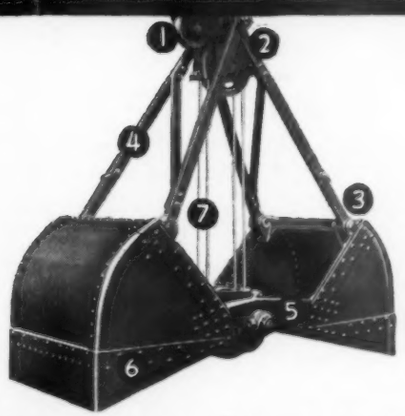
The cream, known as Alexite, is applied to the hands and other exposed parts of the body before beginning work. It is soft, pleasantly scented and easily removed with soap and water after the end of a day's work. It is packed in individual and large shop sizes. A trial sample will be mailed free to industrial users for their own test.

● Drag-line Bucket

Bigger pay-loads and improved "digability" are advantages claimed for the Hendrix lightweight perforated drag-line bucket by its maker, the De Soto Foundry, Inc., of Mansfield, Louisiana.

These buckets are from 20 to 40 per cent. lighter in weight than other buckets, size for size, allowing the operator to use a larger bucket than that for which the machine was designed and yet maintain

SEVEN FACTS
IT WILL PAY YOU TO KNOW ABOUT BROWNHOIST BUCKETS



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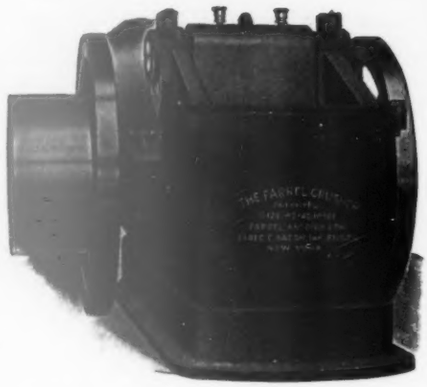

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MANGANESE STEEL
LONG LIFE
ABRASION
RESISTING PARTS
FOR
QUARRY, ROAD,
DREDGING,
AND
MINING MACHINERY

The Frog, Switch & Mfg. Co. CARLISLE, PA.
ESTABLISHED 1881

Perforated bucket emerging from pit with load of sand and gravel.

the allowable loaded weight. By the same token, larger pay-loads are obtainable on operations requiring a long boom. In wet excavating, these loads are increased by leaving the water in the pit instead of in the bucket.

Hendrix buckets are of all-welded construction, with fittings and chain of 10- to 14-per cent. manganese steel. Other features include: reversible manganese-steel tooth points, heat-treated lips, curved backs to facilitate loading and prevent spilling, a one-piece hitch plate and hoist trunnion, and a reinforced spreader bar. They are built in sizes from ⅜ to 20 cubic yards, struck measure, and are available without perforations if desired.

● Dispersing Agent

Any technique which improves the dispersion of cement particles in a Portland-cement mixture automatically allows reduction of water ratio and improves the compressive strength characteristics of concrete. The use of Santorized Trimix liquid is claimed by its maker, L. Sonneborn Sons, Inc., New York City, to represent a contribution to the technique of concrete construction which achieves both of these results of an unusual degree. This is due to the application of the principle of greater wetting by means of additives having great surface activity. Moreover, these results are achieved without in any way interfering with the normal hydration cycle of Portland cement.

The marked advantages of this method are in the reduction of up to 20 per cent. of the normal volume of gauging water and greater workability of the mortar. Slump tests show that when Santorized Trimix is added to the gauging water in proper proportions, the slump of a normal 1-2 mix ranges from six to seven inches, as compared to 2½ inches with the same amount of plain gauging water. Higher strength is obtained when Santorized Trimix is used, because the method imprisons the gauging water used. This lowers evaporation, resulting in more thorough curing.

Greater homogeneity is obtained, too. The addition of Santorized Trimix tends to eliminate the tendency of water to segregate from the cement and aggregate particles. In addition, it produces concrete and mortar of greater water tightness, durability and with less shrinkage.

● Shovel-Scoop

A new shovel-type scoop which can be interchanged with standard forks for greater efficiency in picking up, carrying and dumping all types of loose bulk materials is among new specialized attachments developed by the Towmotor Corporation, Cleveland, to increase the versatility of standard Towmotor lift-truck models.

Scoop attached to lift-truck.

Available in capacities from 8 to 25 cubic feet, the scoop is designed to speed handling of such materials as ore, scrap, foundry sand and bulk chemicals. Manually controlled, the scoops can pick up or dump materials at any point within the lift range. Resetting to digging or carrying position after dumping is ac-

Photograph taken at the annual sales meeting of the Superior Engine Division of the National Supply Company, held recently at the factory in Springfield, Ohio. The meeting was in charge of Arch F. Campbell, sales manager of the Superior Engine Division. New developments indicated by the proving ground of war were discussed and post-war plans formulated.

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Locomotives

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DIESEL ELECTRIC
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FIRELESS STEAM
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PITTSBURGH, PENNSYLVANIA

complished by lowering to floor level until spring-operated catches automatically take hold.

An optional feature is an anti-spilling device which fits over the front lip of the scoop and permits transporting full loads of loose material at good speed over rough surfaces. The anti-spiller is easily pulled out of the way for loading, and remains in a fixed position during dumping, so that loads can spill out freely beneath it.

TRADE NOTES

The Michigan Tractor & Machinery Company, with headquarters in Detroit and a branch established at Grand Rapids, has been organized to serve as distributor in the lower peninsula of Michigan for the Caterpillar Tractor Company. The new company is headed by H. O. Penn, president of the H. O. Penn Machinery Company, Inc., New York, and until recently supervisor of the tractor and used-construction machinery division of the War Production Board, Washington, D. C.

The Eimco Corporation announces the establishment of an additional complete filtration laboratory in connection with its Chicago office. The staff has been enlarged and Paul Richter has been placed in charge of the filtration equipment department replacing C. J. Peterson.

Neil C. Hurley, Jr., has been elected executive vice-president of the Independent Pneumatic Tool Company. He has been associated with the company for 11 years, serving the past four years as vice-president and director.

The STAND-OUT LOADER

The HAISS "75" is everybody's idea of what a stockpile loader should be. Fast. Mobile. Rugged. Simple. Economical. Write for catalog.

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This Field

Trade Literature

DIAMOND JAW CRUSHERS. (Bulletin D43D), 8 pages. Diamond Iron Works, Inc., Minneapolis.

HENDRIX LIGHTWEIGHT DRAGLINE BUCKETS. (Folder) De Soto Foundry, Inc., Mansfield, Louisiana.

SIMPLIFIED GUIDE TO THE SELECTION AND APPLICATION OF COMMONLY USED MOTOR CONTROLS. (Bulletin 4015), 20 pages. General Electric Company, Schenectady, New York.

HEAD AND BODY PROTECTION FOR INDUSTRIAL WORKERS. 4 pages. Strauss Company, Pittsburgh.

W.G.B.—THE ORIGINAL OIL CLARIFIER. 12 pages. W.G.B. Oil Clarifier, Inc., Kingston, New York.

ELECTRIC STEEL CASTINGS. (Bulletin 801), 40 pages. The Eimco Corporation, Salt Lake City.

POWER TAKE-OFFS AND REDUCTION GEARS. (Bulletin 129), 12 pages. Win Disc Clutch Company, Racine, Wisconsin.

VEELOS V-BELTS. 8 pages. Manheim Manufacturing & Belting Company, Manheim, Pennsylvania.

GENERAL CATALOG No. 850. 180 pages. Link-Belt Company, Chicago.

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VIBRATING SCREENS

From Coast to Coast in the U. S. A. as well as in other countries, SECO Screens have been steadily building an enviable reputation for the efficient sizing and grading that is so necessary in meeting today's rigid specifications on stone sizes.

SECO'S "control of motion" is proving itself in nation-wide use—year in and year out.

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BUFFALO, N.Y.

Get a pay load every trip . . .

even in wet digging

★ It's easy enough to move *more material, faster,* when you're using HENDRIX Lightweight Buckets! So step up your yardage in all kinds of digging by replacing old buckets with HENDRIX Lightweights. You gain a 20 to 40 per cent weight advantage over other buckets, type for type . . . which permits the use of larger buckets on your machines, regardless of normal capacity . . . larger buckets on long boom operations, too. In wet digging, you get extra bonus pay loads by leaving the water in the pit. Manganese steel chains, fittings and reversible tooth points are standard equipment on all buckets. Write for literature or ask your dealer.

Three types—light, medium and heavy duty

⅜ to 20 cubic yard sizes.

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

DESOTO FOUNDRY, INC. ★ MANSFIELD, LA.

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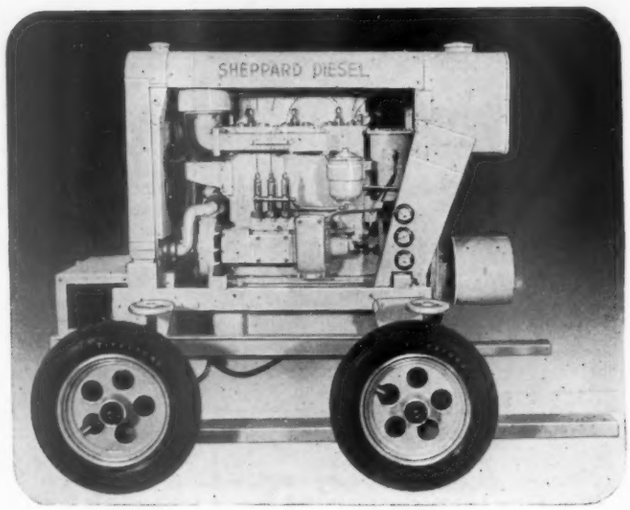

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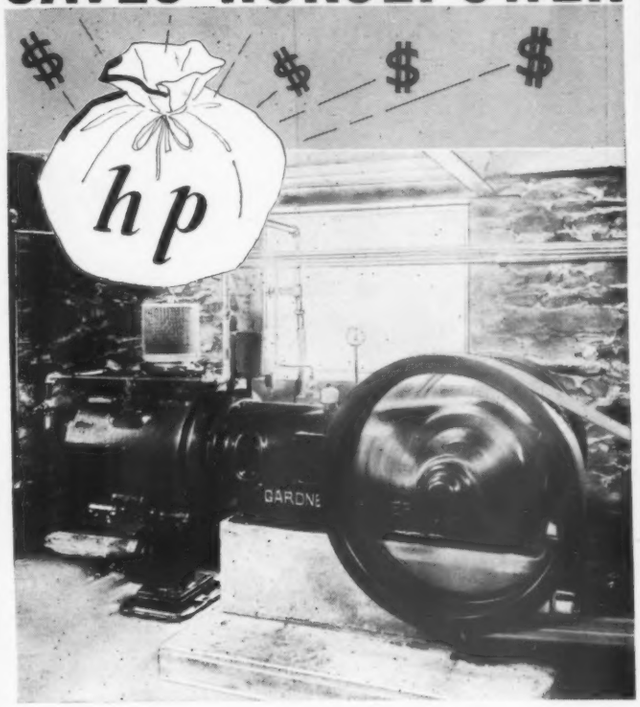

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PAGE ENGINEERING COMPANY
Chicago, Illinois

PAGE *Automatic* **DRAGLINE BUCKETS**

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RANGE and POWER
in dredging Sand and Gravel

EAGLE

"Swintek" Screen Nozzle Ladder

with

PATENTED HEAD

Longer range and greater digging power—that's the general agreement among dredge operators who are outshooting competitors with the EAGLE "Swintek".

This dredging unit handles deep and refractory deposits that are inaccessible to plain suction machines.

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Clean aggregate—the basis of good concrete—is a premium material for rapidly expanding war and industrial purposes.

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Des Moines **Iowa**

May, 1943

The CONCRETE MANUFACTURER

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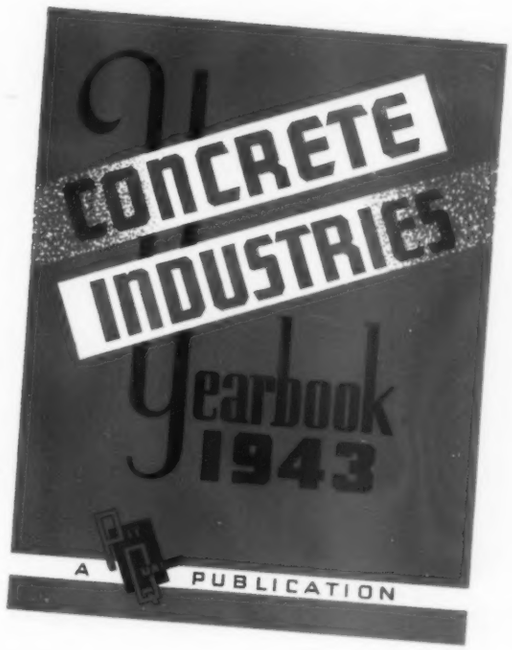

After mailing several thousand copies of the 1943 edition of the Concrete Industries Yearbook to ready-mixed-concrete and concrete-products makers who had previously reserved them, we find that we have exactly 93 copies left unaddressed. This 80-page annual includes:

1. The newest trends in production and marketing methods.
2. Pictures and descriptions of the latest equipment developments.
3. Catalog pages that make it easy to find what you want to buy.
4. Quickmail inquiry coupons which reduce writing for information, literature, etc., to a simple procedure.

These few remaining copies of the 1943 edition will be sent free of charge to recognized producers of concrete products and ready-mixed concrete who request it on their letterhead. Be sure to state just what you produce (block, brick, pipe, ready-mixed concrete, etc.) when making your request.

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The T. L. SMITH CO., 2835 N. 32nd St., Milwaukee, Wis.
SMITH-MOBILE
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The CONCRETE MANUFACTURER

MAY, 1943

A SPECIAL SECTION OF PIT AND QUARRY DEVOTED TO PRODUCTION MARKETING AND USES OF CONCRETE PRODUCTS AND READY - MIXED CONCRETE

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5,000,000 Cubic Yards Poured at Shasta Dam

Shasta Dam in Sacramento River north of Redding, California, is 85 per cent. completed. Recently the 5,000,000th cubic yard of concrete was poured in the forms of the massive structure which, when completed, will be one of the largest structures of its type in the world.

Unaccompanied by the fanfare of peace-time years, an 8-cubic yard, concrete bucket was raised from the dock at the foot of the 460-foot central control tower, and was sent winging its way across the canyon on a high cableway. In the bucket was the five millionth cubic yard of concrete. Attached to the bucket was a sign, explaining that the bucket was loaded with the concrete which would mark another milestone in the dam's construction.

About 1,500,000 cubic yards yet must be poured on the structure before it is finished. The remaining concrete work will be more difficult, as the top of the huge concrete arc will be of more complicated construction than the base.

The first concrete was poured at the dam on July 8, 1940. Since that time Pacific Constructors, Inc., has been operating 24 hours per day, seven days per week.

Priority Assistance Is Denied Louisville Firm

The Colonial Supply Company, Louisville, ready - mixed - concrete producer, was recently denied all priority assistance for a period of three months.

The denial was contained in a finding of the War Production Board, which held that the construction of a swimming pool on the estate of Senator A. B. Chandler used critical materials and "hampered the war effort."

Concrete-Block Houses Prove Worth in Storm

Concrete - masonry buildings in Gateway Gardens, a Kokomo, Indiana housing project, rode out a tornado without suffering structural damage, while many neighboring dwellings were wrecked, according to Dennis F. Taylor, manager of the Kokomo project.

The storm struck the southern section of Kokomo last year. Many houses were destroyed in the area immediately adjoining Gateway Gardens, where damage was confined to window glass and a few downspouts and gutters.

Truck-Mixer Slides into River; Driver Escapes

A ready - mixed - concrete truck owned by the Louis Foster Lumber & Builders' Supply Company of Port Huron, Michigan, skidded across an icy pavement and rolled down a bank into the Black River recently.

The driver, Edward Myles, escaped injury by jumping from the cab before the 5-ton vehicle plunged down the river bank.

Would Build Petroleum Pipe-Line of Concrete

Representative James M. Curley of Massachusetts has prepared a bill to authorize the War Department to construct a concrete pipe-line from Chicago to New York to supply petroleum to meet a critcial fuel-oil shortage in the East.

Representative Curley explained that if the War Department put 500,000 to 1,000,000 men to work on the undertaking it could be completed within forty-five to sixty days.

Eleven Truck-Mixers Are Damaged in Fire

Eleven truck-mixers were damaged April 4 at Evansville, Indiana, when fire broke out in the old county garage in that city.

The equipment was owned by the Concrete Supply Company, ready-mixed-concrete firm, Evansville. The damage from the fire was estimated at $25,000.

Grand Rapids Concern to Furnish Concrete Pipe

The Lamar Pipe & Tile Company, Grand Rapids, has obtained a contract to supply the Muskegon County (Michigan) Highway Department with its requirements for 1943.

The special-body truck with load of blocks fastened and ready to be lifted in position for delivery.

Another view of the truck showing how it picks up a 315-block load in the McCrady-Rodgers yard.

Special Truck Picks Up and Delivers 315-Block Loads Without Manual Aid

another ON THE SPOT report

By W. E. TRAUFFER

THE McCrady - Rodgers Company, one of the leading building material producers and dealers in the Pittsburgh area, operates a concrete-block plant in suburban Braddock which has many claims to fame. This plant has not only large capacity and modern equipment and methods but it also includes a variety of interesting methods and equipment which can probably not be found in another single plant. It is located on the Monongahela River at the foot of Seventh Street in Braddock in the company's largest yard. This location is in the heart of the Pittsburgh steel-producing area and yet close to some of its most rapidly growing residential areas.

The McCrady Brothers Company was founded in 1870 to deal in builders' supplies and in 1929 was combined with the Rodgers Sand Company to form the McCrady-Rodgers Company. Since then sand-and-gravel production has become an important part of the company's business. The production of ready-mixed concrete was begun in 1930 and the company is said to have introduced transit-mixed concrete to the Pittsburgh area. The company also produces ready-mixed mortar and with its concrete blocks is in a position to meet practically any demands for materials needed in building construction.

The history of its concrete-block production is almost a history of the industry. The McCrady Brothers Company first produced blocks on a small scale in 1919 with hand-tamped molds. In 1922 the first tamper-type machine was installed. Other improvements and additions were made from time to time. The first Besser block machine was installed in 1927 and by 1937 the company was operating four Besser face-down tampers with side-opening molds which had a combined capacity of 3,500 blocks in 8 hours. In that year the plant was rebuilt and enlarged. The 4-compartment steel aggregate bin now in use was installed over the two existing 20-inch by 15-foot Eberling continuous mixers. The concrete was fed from the mixers to the hoppers of the four block machines by chain-conveyors.

In 1939 the present Besser Super Stripper and a 40-cubic foot Besser skip and mixer replaced two of the old machines and their continuous mixer. Up until 1940 rock-face blocks were made and a rock-face attachment was used on the Super Stripper. There are still occasional demands for this type of unit but these are now purchased from other producers. In 1941 the Besser Super Vibrapac and its 40-cubic foot skip and mixer replaced the other two old machines and their mixer. A vibrator mechanism was also installed on the Super Stripper to make possible the manufacture of a denser block with lower absorption. With these two machines the plant now has a capacity of 7,600 standard blocks in 8 hours. Other improvements included a Butler bulk-cement screw-conveyor, elevator and bin and a Butler traveling weigh larry or batcher. Two Clark gasoline high-lift trucks were also purchased for use in the yard.

Blocks laid up to show how the special corner units are used.

In normal years the company's chief outlet for its blocks has been private building and residential construction. During 1941 and 1942, however, federal housing projects took most of the output. Included in these projects were two which are said to be among the largest in the country. One, the Terrace Village Project, consists of 85 buildings, housing 802 people in 3-, 4- and 5-room apartments. The other is the Hazelwood development consisting of 105 buildings, housing 1,000 people in 3- to 6-room apartments. During 1941 and 1942 the plant was operated two and three shifts daily to meet these demands. In recent months this demand has slackened off considerably.

The sand and gravel used in this yard and plant are dredged from the Ohio River and are unloaded from barges by two derricks, one of which supplies the block plant and the other bins. Celocrete light-weight aggregates are also used but no intensive effort has yet been made to push the blocks made from them. These four aggregates are stored in the Erie steel block-plant bin which has four compartments with a total capacity of

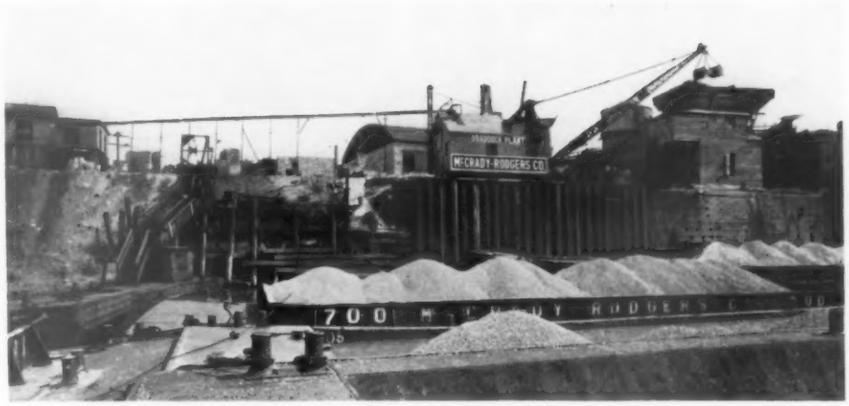
200 tons. Bulk cement is discharged from hopper cars to the screw-conveyor and bucket-elevator feeding the 100-barrel Butler steel cement bin. Only standard Portland cement is used.

The aggregate mixture used consists of sand, ¼-inch shot gravel, and ¾-inch gravel. According to J. G. Bennett, superintendent, the use of the large size of gravel has greatly increased the compressive strength of the blocks. He says, however, that considerable experimentation was necessary before the texture was as good as in blocks made with finer gravel. No blocks are delivered until they test at least 1,000 pounds per square inch. This strength is usually attained in 4 days. Garcolite admixture is used in all the blocks for its water-proofing qualities. The amount used varies with the aggregates but averages 10 per cent. of the weight of cement used.

The aggregates and cement are discharged from their bins into the two compartments of the Butler traveling weigh batcher which is equipped with a 3-beam scale. This discharges the batches into the two Besser mixers from which the concrete is fed by the two Besser skips into the hoppers of the two block machines.

The Besser Super Vibrapac machine has a pneumatic off-bearer with a Curtis air hoist. Instead of the usual boom this is suspended from an A-frame traveling overhead crane so that several 96-block rack cars can be loaded without moving them in the process. This arrangement is successfully handling the output of this machine which makes standard blocks in threes at the rate of 10 per minute.

The Besser Super Stripper has a similar off-bearer but this takes the blocks from an off-bearer conveyor. This off-bearer was installed when a large order was received for 8- by 12- by 16-inch solid blocks which weighed 117 pounds each exclusive of the 17-pound pallet. A crew of three men, even when alternating jobs, was unable to rack the blocks as fast as they were made. This machine makes single blocks of this type or standard blocks at the rate of 6½ per minute. The use of the off-bearer and the extension of the automatic front conveyor to 12 feet from its standard length of 7 feet have solved this problem and make it possible for the transfer man to take occasional short rest periods.

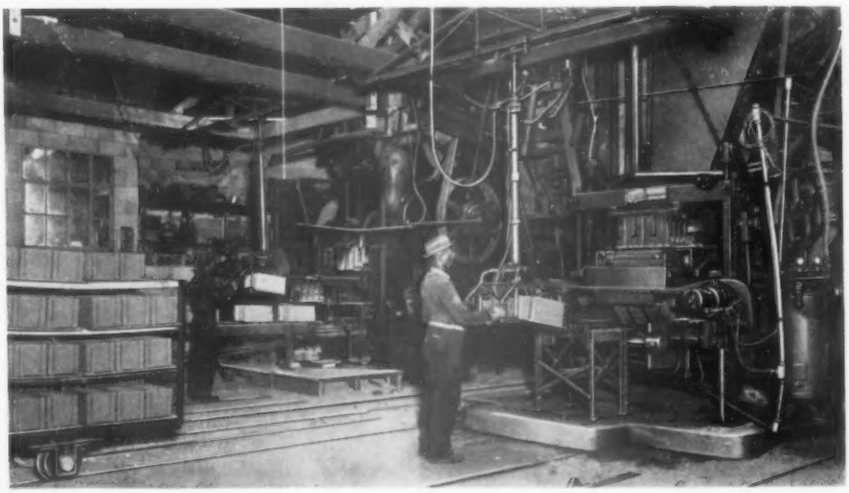


Plant and unloading derrick as seen from barge on the river.

One of the large housing projects supplied by the plant.

Up until last winter a track and transfer car system had been used to move the loaded cars into the seven double-track kilns. These hold 12 cars each. The saturated steam for curing comes from a 300-horsepower boiler which also provides steam for the derrick hoists, for heating, etc., for the entire yard. The cured blocks were formerly removed from the cars and pallets outside the kilns into 8-high piles on wooden platforms, from which they were removed to storage by one of the two Clark lift trucks. These platforms were open at one end so that the prongs of the lift truck could slide under them and pick off the blocks. With two tiers of blocks the yard has a capacity of 250,000 units, 8-inch equivalent.

During the winter the tracks have been removed and the cars have been cut down into racks. These are now moved into the kilns by one of the trucks and hauled out of them to yard storage by the other. There the blocks are removed from the racks into piles with every sixth course laid horizontally so that they can be picked up by the lift truck and loaded on the delivery trucks without manual rehandling. Special prongs on the trucks make this method possible.



View inside plant showing the stripper and vibration machines.

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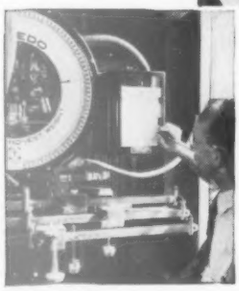

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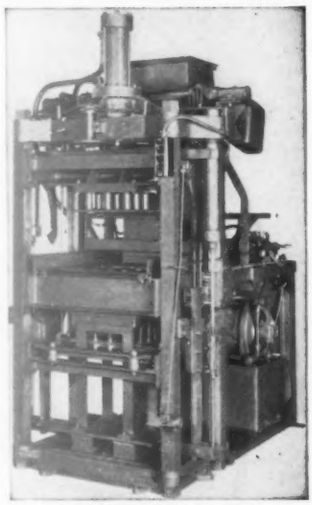

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The company also uses a special Fontaine demountable delivery truck body which is unique in this field, although it has been used for many years for the delivery of clay bricks. A body of this type which was purchased in 1932 had a capacity of 100 standard blocks. This was replaced in 1940 with an aluminum body of 315-block capacity. This body picks up the blocks from specially-stacked piles on wooden platforms, carries them to the job, and there sets them down again in piles ready for use, all without manual rehandling. One man can pick up a load in less than 10 minutes and set it down at the job equally fast. A load of equal size would take 4 men and the truck driver from 30 to 40 minutes to load or unload. These bodies are made by the American Truck & Body Company.

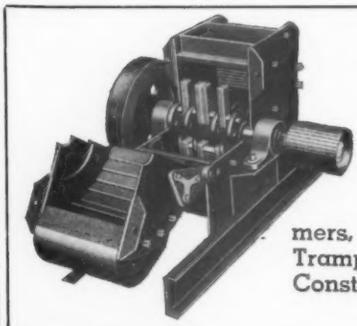
Traveling weigh-batcher which supplies both the concrete mixers.

The company has found it advisable to make only a limited number of sizes and types of blocks which can be sold in large quantities. At present the list includes 4-, 5-, 6-, 8-, 10- and 12- by 8- by 16-inch units and the necessary solids, corners, jambs, etc. A "termite" block which is also made is said to have been developed at this plant for federal housing jobs. On these jobs it is specified that the top course in each wall must consist of solid blocks or hollow blocks filled with concrete. The "termite" block is made with a set of cores cut to three-fourths the usual length so that the core holes extend only three-fourths of the distance through the blocks.

A special corner block has also been made in the 10- and 12-inch sizes to eliminate the half blocks or extra-long blocks used for corners. This is an 8- by 8- by 16-inch block made with a 4-inch square projection at one end for a 12-inch wall and a 6-inch square projection for a 10-inch wall. These blocks are alternated in successive courses.

One of the lift trucks stacking units in the yard.

The officers of the company are: William F. McCrady, chairman of the board; William Rodgers, president; John B. McCrady, vice-president and sales manager; Edward McCrady, Jr., vice-president and manager of yards. J. G. Bennett is superintendent of the Braddock yard.



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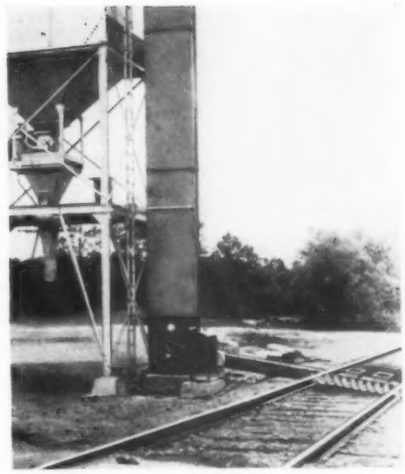
Tips on Maintenance for Ready-Mix Operators - II

● This article, the second in a series, covers maintenance suggestions for ready-mixed-concrete manufacturers and is devoted to conveyors and elevators for cement and aggregates, and clam-shell buckets. The third and final installment will cover the maintenance of truck-mixers and agitators and truck chassis.



Bulk-cement plant elevator and screw-feeder for unloading cement from hopper-bottom cars.

another P-Q AND exclusive

SINCE the advent of hopper-bottom cars for the shipment of bulk cement, most of the cement-elevator units have been equipped with screw-conveyors for unloading the cement from the cars and delivering it to the boot of the vertical bucket-elevator. This arrangement of the screw-conveyor is clearly shown in the accompanying illustration of a conventional bulk-cement plant. In nearly all cases the conveyor is driven from the foot shaft of the elevator and has only two main bearings, one at the head and the other at the foot of the screw. Experience has shown that the most practical method for lubricating these two bearings is by the use of a combination grease cup and Alemite fitting. This arrangement makes grease available in the grease cup so that greasing can be done at any time during the operation of the conveyor without the use of the grease gun. The grease in the grease cup can be replenished with the grease gun every few days.

The steel cover for the screw-conveyor housing should be sectional and equipped with quick-acting clamps for easy removal. This cover should be removed periodically for inspection and any foreign materials or hardened cement should be removed from the screw casing and the screw flights.

Flanged covers should be provided for the hopper-car inlet openings in the top of the screw housing to protect the interior of the screw from the weather and the possibility of foreign materials falling into the conveyor.

Where bevel gears are used in the screw-conveyor drive, they should be greased with a heavy gear compound, commonly called "crater compound".

The screw-conveyor which unloads hopper-bottom cars is located between the ties and beneath the track rails. Inspection should be made to make sure that the railroad tracks or the ties do not bear on the conveyor.

Good practice is to keep the screw and the vertical bucket-elevator running for 5 minutes after the car has been emptied to make sure that all the cement is cleared from the screw and the elevator. This is most important when the plant is to be shut down after completion of the day's work.

At some plants the cement is delivered by trucks and a truck hopper is used for unloading them. Truck hoppers should always be equipped with protective covers to keep the weather out. There should be a screen or grid in the bottom of the hopper so that foreign materials and hardened lumps of cement will not enter the conveying system.

It has been found that cement elevators work much better with a screw-conveyor for supplying the cement to the boot of the elevator than without the screw. Where difficulties are encountered, including severe dusting due to the loading of cement direct from a truck, etc., into the boot of the elevator, the addition of a screw-conveyor will overcome the trouble.

The power drive for the cement conveyor should have a shear pin or other device, located preferably on the main drive, to prevent damage in case of an obstruction or foreign object entering the conveyor system with the cement, or failure of the chain to which the buckets are attached. The shear-pin arrangement is good protection for the equipment as it provides an automatic stop for the mechanism. SAE 50 oil should be used on the drive chains and sprockets. Normal inspection of the drive chains and sprockets will indicate when replacement or repair is required. The sprocket on the output shaft of the gasoline engine or electric motor which drives the conveyor is subject to the most wear and will need replacement more frequently than other sprockets.

The foot shaft has two main bearings and should be equipped with combination grease-cup and Alemite fittings like those described for the screw-conveyor. Normally no adjustment of the foot shaft is provided so that a stable condition will be assured.

Elevator Chain The chain to which the buckets are attached for the vertical, inclosed cement elevator should never be lubricated. The chain should be inspected at frequent intervals for wear and tightness. Nearly all cement elevators have inspection doors on two sides of the housing near the bottom. Worn chains should be replaced well in advance of any possible breakage. The barrel portion of the chain should wear uniformly, if the elevator is properly lined up between the foot and the head shafts. If the elevator is not properly lined up, the chain side bars will show excessive wear on one side. Where this evidence occurs, the alignment between the top and bottom sprockets of the elevator should be corrected. This can be checked by plumbing (using a plumb bob) between the two sprockets. The correction can be made either by means of the take-up at the top of the elevator, which aligns the top sprocket, or by plumbing the entire elevator by moving the bottom of the elevator to line up both sprockets.

The above suggestions are highly important, as any operator will attest who has had breakage of the elevator chain with the consequent falling of the chain and buckets in a tangled mass into the bottom section of the elevator.

Each bolt which fastens the elevator buckets to the elevator chain

should have its head inside the bucket. If the bolt is reversed, the projection of the bolt, lock-washer and nut retards the clean discharge of cement and creates places in which cement can accumulate in the bucket. It is good practice to peen over the ends of the bolts to prevent the buckets from coming loose from the chain.

Any broken or damaged buckets should be replaced.

The head shaft has two main bearings, the same as the foot shaft, and these should be lubricated as required.

The tautness of the elevator chain should be carefully watched. This requires more attention during the first three or four weeks of operation of a new elevator than is required thereafter. The tautness of the elevator chain can be examined through the housing inspection doors. A convenient method of test is to push or swing the two strands of chain toward each other manually. If the two chains can not be brought together to make contact, then the adjustment for tautness is correct. If the chain is loose, it can be made tight by means of the take-up at the head of the elevator.

If the elevator chain is too loose, the buckets will scrape the bottom of the elevator and the buckets will lose part of their load and go up to the top of the elevator only partially full. Also, when the chain is loose, it will ride the sprockets instead of meshing properly, causing rapid chain and sprocket wear.

The housing of the elevator should be inspected for weather tightness. Common practice is to use felts in the horizontal joints and these felts should be mitered at the corners for a good tight fit. The head of the elevator should preferably have a sheet-metal housing to protect the mechanism and the interior of the housing from the weather.

A ladder should be provided to give access from the ground level to the top of the elevator for lubrication and adjustment of the take-up.

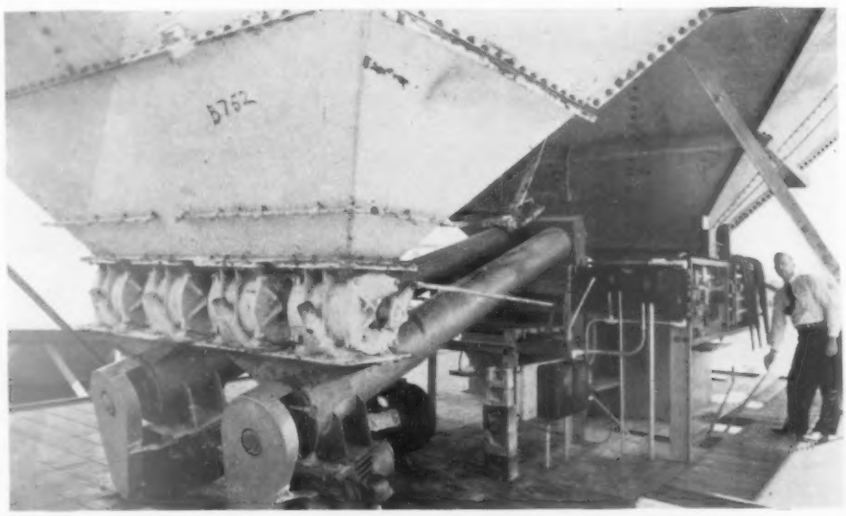
On the centrifugal type of cement elevator there is an adjustable throat plate in the discharge chute at the top of the elevator. This plate should be adjusted so that the buckets in coming around at the top of the elevator miss the edge of the plate by approximately one inch. If the plate is adjusted with a larger gap, the buckets will spill cement down into the elevator casing and cause cement to build up in the boot of the elevator. Filling of the boot section of the elevator with cement will cause the buckets to dig through the accumulated cement and may result in breakage of the buckets and chain. Some elevators have an inspection hole in the casing located adjacent to the throat plate so that its adjustment may be readily inspected.

It is a good idea to have a concrete foundation underneath the vertical cement elevator and the screw-conveyor to avoid settlement.

The braces from the elevator to the bin should be kept tight.

The elevator buckets should be inspected and kept clean.

If the plant is operated by means of a gasoline engine, the speed should be checked to make sure that the engine is running at the speed for which the plant was designed. Higher operating speeds may cause a discharge of cement from the buckets to by-pass the discharge chute and thus decrease the capacity of the elevator instead of increasing it and, at the same time, filling the boot of the elevator with cement which is objectionable for the reason given above.



Two automatic 12-inch screw-conveyors for batching four kinds of cement to a single weigh batcher. Selecting levers are located adjacent to the scale-beam box.

Inclined Screw-Conveyors for Batching Cement It is good practice to house the batcher operating platform against the weather, and this will provide protection against rain, etc., for the cement batcher screw-conveyor and the batcher operator.

It is good practice to operate the conveyor for 5 minutes after completing batching in order to clear it of cement when the work is finished.

Some batcher screw-conveyors are equipped with a flushing governor at the discharge end. These flushing governors are provided with inspection doors on two sides. This makes it convenient to remove such foreign materials that come with the cement, like rags, paper, wood, wire, twine, cement lumps, etc. Also, the springs which operate the flushing governor should be kept in proper adjustment of tension.

The sprockets and chain on the electric-motor drive for the conveyor should be lubricated with SAE 50 oil.

Usually the screw-conveyor is driven by a gear-head electric motor which is equipped with a bayonet gage indicator for the proper oil level. The oil level should be maintained, using the grade of oil specified by the motor manufacturer, usually SAE 10 or 20.

In many cases the batching screw-conveyors are equipped with electrical controls for automatic cut-off. A push button starts the motor to operate the screw-conveyor and contacts in the scale mechanism on the cement-weighing batcher shut the motor off when the proper weight is reached. It is advisable to have a simple wiring diagram of the electrical control circuit available at the plant so that a local electrician can make adjustments or repairs.

Aggregate Elevators The recommendations for maintenance and care of the cement-conveying equipment will apply, with some exceptions, to aggregate elevators.

The power drive for aggregate elevators is at the top instead of at the bottom. This requires a ladder for access to the top of the elevator and a machinery platform at the top of the elevator for lubricating and servicing the machinery. Also, the take-up for the chain is located at the bottom of the elevator instead of at the top.

The normal wear on the chain and sprockets in an aggregate elevator is faster than on the same parts of a cement elevator. Therefore, the inspection of the chain and sprockets should be made more frequently and given closer attention.

The following is a list of items of repair parts that should be kept on hand for conveyors to take care of emergency repairs:

Central-mixing plant equipped with a 2-cubic yard mixer. The continuous bucket-elevator for aggregates is supplied by a belt-conveyor running under the track bins.

A few shear pins for cement elevators.

A sprocket for the motor output shaft.

Some offset links for the drive chain.

One bearing for the boot shaft and one bearing for the head shaft.

A few links of elevator chain and a few bucket attachment devices.

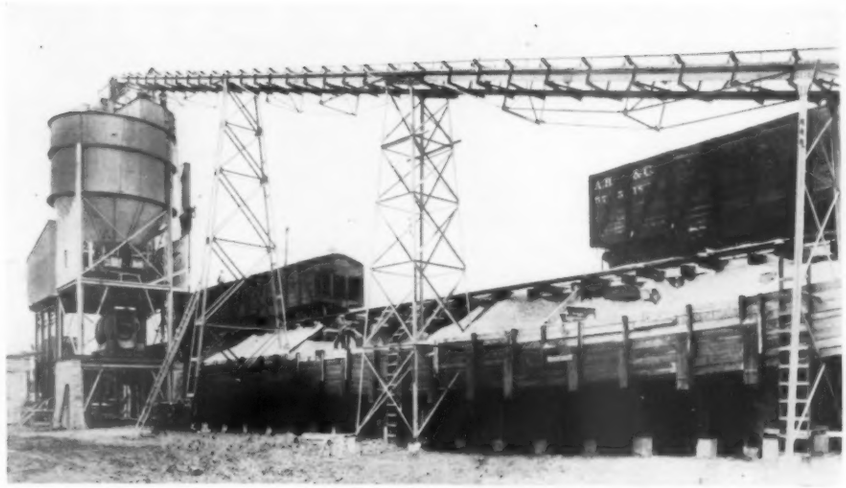
Six chain pins.

Maintenance of Belt-Conveyors The belt should be inspected regularly and closely for minor cuts and damage. Such spots can be repaired with cement made for this particular purpose. Belt fasteners should be watched for breakage, as such breakage can do enormous damage to the belt.

Idlers should be watched to see that they turn freely at all times. Lubrication of the idlers should be set up on a systematic basis, as required. Over-greasing of the idlers will put grease in contact with the belt and cause rapid deterioration.

Shaft alignment should be checked carefully because shafts can get out of line due to the settling of supports or foundations.

Do not allow the belt to run over the edges of the pulleys. This condition can be corrected by lateral adjustment of the idlers until the belt tracks true on the pulleys.



This plant receives its aggregates from the long inclined belt-conveyor which is fed from the railroad trestle bins.

The take-up for the belt should be adjusted so that it is just right; never make it too tight. A belt that is too tight throws undue strain on the belt fabric and it will fail rapidly. There should be just enough tension in the belt for proper driving. The speed of the belt should be regulated so that a maximum, uniformly distributed load will be carried by the belt.

Every precaution should be taken to make sure that where the material is first loaded on the belt no undue abrasion or impact occurs. This impact may be avoided by the use of baffles, and the slope and arrangement of the chute. The aggregate, as it leaves the chute, should be moving in the same direction as the travel of the belt.

Make sure the discharge edge of the chute has proper clearance from the belt. Use side pieces made of old belting to prevent the spillage of aggregate over the sides of the belt at the loading point. Use extra idlers for the support of the belt in the area of the loading zone.

If materials collect on the pulley side of the belt, the installation of scrapers or brushes is advisable to keep the under side of the belt clean.

Keep all oil and grease away from the belt.

Be sure that there are sufficient idlers to properly support the belt and the load it carries for its entire length.

Clam-shell Bucket Maintenance In clam-shell buckets thorough and regular lubrication is perhaps more important than it may at first seem, due to the very nature of the concrete aggregates being handled, which in themselves are gritty and abrasive and which may have rather free access to the bearings in rotating parts.

When first installed, new buckets should be lubricated at least twice during the course of the usual work shift so that the bearings, shop-fitted and having close clearances, may have an adequate film of lubricant available at all times, which assists in wearing in the bearings smoothly and without the danger of seizing and galling on the shafts.

When the bearings are thoroughly worn in, regular lubrication at the beginning of each work shift will be sufficient.

The parts to be lubricated are as follows:

Head sheave bearings
Lever arm sheave bearings
Guide roller bearings
Corner bar bearings
Main hinge bearings

A high-pressure type of grease gun is furnished with every bucket, and a good grade of high-pressure lubricant will give the best results.

In the lubrication of sealed anti-friction bearings as commonly used in lever arm sheaves caution must be exercised to avoid building up too high an internal pressure in the bearings as this contributes to rapid bearing failure.

Cable life may be greatly prolonged by making certain that the closing cable is of the correct diameter to fit properly the grooves in the bucket sheaves, that the sheaves themselves are free from defects, either in the grooves or on the flanges, which might mar the cable, and that the sheaves rotate freely on their respective shafts.

Care also should be taken that the guide rollers at the head of the

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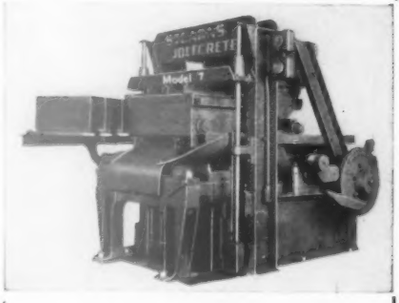

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Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

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G. M. Friel, Manager — Columbus, Ohio

bucket rotate freely, and they should be promptly replaced when their surfaces become grooved or have flat spots worn in them due to contact with the closing cable.

Proper lubrication of the clam-shell bucket cables, as recommended by the cable manufacturer, is well repaid in added life, in that it not only affords protection against corrosion of the individual external wires but also prevents corrosion of the internal wires of the cable strands, and, in addition, preserves the hemp center which supports the cable strands.

Inasmuch as the greatest amount of cable wear invariably takes place in that portion of the closing cable entering the head of the bucket, advantage should be taken of cutting the cable in lengths sufficient to utilize all the scoring on the closing cable drum. As the cable becomes worn and frayed, the point of maximum wear may be shifted by pulling the worn portion through the bucket without totally unreeving the cable from the drum. Frequently several such shifts can be made, after which the cable may still be switched end for end, using in the bucket that portion of the cable originally on the drum.

Naturally some materials are easier to dig than others. For this reason the clam-shell bucket is arranged for variable internal reeving of the closing cable in the bucket, increasing or decreasing the amount of cable pulled out of the bucket to close it, which accordingly affects the digging efficiency. Therefore, if the bucket is digging so much material that it regularly overflows the scoops, the number of parts reeving the closing cable should be reduced, thus decreasing the time required per cycle of operation by consuming less time in closing the bucket.

Conversely, if the bucket-closing cable is not already reeved the maximum number of parts and is not digging full loads, greater efficiency will result by increasing the reeving in the bucket, the resultant greater loads more than compensating for the slight time increase in pulling out the additional cable required to close the bucket.

In the handling of very coarse aggregates, resulting in only partial loads (although the closing cable may be fully reeved), the application of counterweights will add materially to the digging ability of the bucket. It is always recommended that these counterweights be applied to the outside of the scoop back plates, where, by actual test, they have proved to be most efficient in increasing digging ability.

Careful inspection should be made of all the bearing points, and the amount of play in the bearings noted so that bushings may be renewed before the shafts have worn into the virgin metal of the main piece of which the bushing is merely a renewable part. Excessive wear at such points requires replacement of the worn-out metal by welding and reboring to accommodate the bushing, resulting in considerable added expense and enforced idleness of equipment.

Bushing wear can usually be detected without dismantling the bucket by setting the open bucket on some firm surface and noting the amount of play in the bearings as tension is applied to and released from the operating cables, by testing such parts as sheaves and rollers by hand, or by prying such parts as the corner bars and main hinge with a crowbar.

When excessive lip wear occurs, causing leakage of material, particularly at the scoop corners, the lip cutting edges may be renewed by the application of an electric weld using a hard-surfacing electrode, which results in desirable resistance to abrasion and reduces the resistance to penetration of the material being handled, resulting from worn blunt edges.

Two 1½-cubic yard clam-shell buckets loading 60-ton, three-compartment bins of a portable batching plant.

Missouri Mayor Takes Burial-Vault Agency

Mayor W. E. Boyd and associates of Perry, Missouri, have taken the agency for concrete burial vaults for fourteen counties in northeast Missouri and have opened an office in the Locke Building in that city.

Erects Temporary Plant near Air-Base Project to Hasten Concrete Pouring

A view of the batching plant with aggregate hopper and conveyor in foreground.

THE W. E. Anderson Sons Company of Columbus, Ohio, recently completed a job which is a good example of the important part ready-mixed concrete is playing in our war effort. The original subcontract called for 30,000 cubic yards of concrete to be used in the construction of the cantonment section of the Lockbourne Air Base near Columbus for which the Owens, Ames & Kimball Company of Grand Rapids, Michigan, was one of the contractors. Later an additional 40,000 cubic yards was produced for the airport section for which W. L. Johnson & Associates of Hicksville, Ohio, had the contract. A temporary batching plant was erected near the project and the first concrete was delivered early in March, 1942. The major part of the work was completed by November 1, but the plant has since supplied occasional small amounts of concrete needed for finishing touches to the project.

The plant was erected at the only railroad siding available near the project and the bulk cement used was received in cars. It was unloaded into a screw-conveyor, and a bucket-elevator discharged it into the 375-barrel C. S. Johnson portable sectional bin. Rotary gates controlled the discharge of the cement into the central cement compartment of the Johnson weighing batcher. A beam scale with an over-and-under indicator was used.

The sand-and-gravel aggregates were hauled by trucks from the West Welch Avenue plant of the American Aggregates Corporation in Columbus, a distance one way of 11 miles. This work required the almost steady use of a fleet of 18 dump trucks, each hauling two 2½-cubic yard batches per load. At the plant each batch was dumped separately into a 4-cubic yard hopper from which a 30-inch by 84-foot belt-conveyor carried it to a 4-cubic yard hopper under the weighing batcher.

A tube from the cement compartment of the batcher extends down into this hopper so that, when the hopper discharge gate is opened, the cement is inclosed in the mass of aggregates going into the truck-mixer. This reduces the possibility of cement adhering to the hopper and of segregation of the sand, gravel and cement. Both the batcher and the hopper have lever-operated gates.

According to Ralph H. Anderson, the use of pre-batched aggregates was responsible for a considerable time saving. Truck-mixers were consistently loaded at less than one-minute intervals, something which could not have been done if the aggregates for each batch also had had to be weighed out at the plant. The plant operator only had to measure out the cement and water and dump these and the aggregates into the mixers. In loading one truck each minute these operations alone kept him busy. When operations were at peak capacity, one man was stationed at the aggregate-receiving hopper, one unloaded cement, and one wrote out the tickets. Because of the varying heights of the mixers used, another man was kept busy adjusting the canvas sleeve attached to the plant discharge hopper. This operation, during periods of less demand, was taken care of by the truck driver but during rush periods everything possible was done to keep the drivers from being delayed by extra duties.

During the main construction period the plant was operated 14 hours daily and 7 days a week. The maximum output was 100 cubic yards per hour and on the busiest day this pace was kept up for 14 hours. In one 41-day period 38,000 cubic yards of concrete was produced and placed in spite of considerable rain. The length of haul from the plant to different parts of the project varied from 2 to 4 miles.

When erection of this plant was started it was not certain that electricity would be available, so separate gasoline engines were provided

Weigh batcher with scale and indicator.

for the conveyor, elevator and compressor. The conveyor and elevator are driven by 15-horse-power Hercules gasoline engines. The Gardner-Denver tank-mounted compressor is driven by a 1-cylinder Cushman Cub gasoline engine.

As this plant was far from the city water mains, a 75-foot well was drilled to supply the needed mixing water. A Layne Ohio turbine pump, driven by a ½-horsepower U. S. electric motor, pumped the water to a Neptune automatic meter from which it was discharged into the mixer along with the cement and aggregates. The truck water tanks were used only to carry water for washing out the trucks and for emergency use at the job.

The company owns a fleet of 16 Jaeger truck-mixers of 2- and 3-cubic yard capacity of which 10 are recent models purchased either late in 1941 or early in 1942. Most of the mixers are mounted on G.M.C. 3-ton truck chassis and all are driven by Hercules gasoline power units. On this job the largest possible load one of these mixers could haul was 2½ cubic yards because the Ohio truck weight limit is 24,000 pounds on a single chassis. The company also owns 30 Ford trucks

Loading one of the high-dump truck-mixers.

equipped with Clark dump bodies. Due to the time limit on the jobs, the Anderson Haulage Company, Columbus, participated to the extent of furnishing a portion of the trucks and the truck-mixer equipment used.

While the ready-mixed concrete made under the original contract was being used in the construction of the cantonment section, a contractor was laying a large part of the runway concrete with pavers. Later, when the ready-mixed concrete was being used in the runways, this contractor was also using the two 34-foot pavers for the same work. It is interesting to note that more ready-mixed concrete was laid in 14 hours than the two pavers could lay in 20 hours. Also, according to government inspectors, the ready-mixed concrete gave noticeably higher strengths.

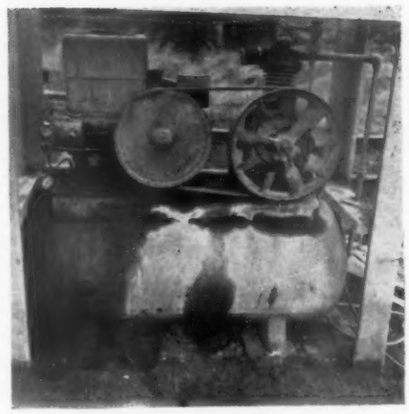
The government specified 1½-inch-minus aggregates, a 5½-sack mix and a 2-inch slump for 90 per cent. of the concrete, the only exceptions being made for special structures. When the paving of the runway was begun, a moderate amount of reinforcing steel was used. Later the slab thickness was

Gasoline engine which drives the aggregate conveyor.

increased from 8 inches to 9 inches to effect a greater steel saving. Finally the use of reinforcing steel was eliminated for the last half, or about 300,000 square yards of the paving. No admixtures of any kind were used in the concrete except in March when, for a few weeks during cold weather, 2 per cent. of calcium chloride was added.

The W. E. Anderson Sons Company is a partnership composed of W. E. Anderson's sons Edwin E. and Ralph H. The original company was formed in 1915 to do general trucking and had its first experience with ready-mixed concrete in 1930 when this material was hauled for a local producer. In 1932 the company took over this producer's plant and his business.

From 1935 to 1941 the concrete operations were carried on under the name of the Mixed Concrete Corporation. Early in 1937 a complete and modern new batching plant was erected at 312 West Gay Street, in the heart of the city. This was described in the September, 1937 issue of PIT AND QUARRY. This plant has since been moved to a new



Tank-mounted compressor and engine.

location near the Army's Columbus General Depot for which it supplied about 24,000 cubic yards of concrete in 1942 alone. Its mixers are also loaded at batching plants at the South and North plants of the American Aggregates Corporation. The latter installation was described in the October, 1940 issue of PIT AND QUARRY.

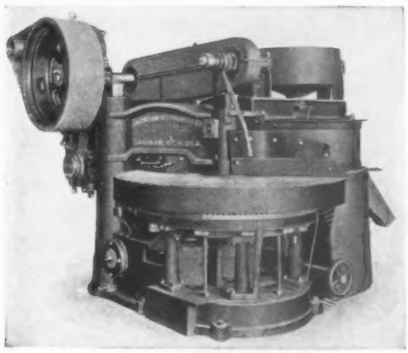
The company used bathtub bodies for delivering its concrete until 1934, when a fleet of four 1½-cubic yard Jaeger truck-mixers was purchased. These mixed 10,000 cubic yards of concrete in that year. By 1937 the fleet consisted of 10 Jaeger 2½-cubic yard truck-mixers and now comprises 16 machines. In 1941 the total production was about 66,000 cubic yards and in 1942 considerably over 100,000 cubic yards of concrete was produced.

The company many years ago found it profitable to maintain its own garage and repair facilities and is now equipped to make almost any kind of repairs.

A force of eight mechanics, four working at night, examine the equipment regularly to prevent expensive repairs and unnecessary replacement of parts. The appearance of its equipment is also considered important as an advertisement of its product. Every morning before leaving the garage the drivers paint form oil on the mixer drums to keep the concrete from adhering to them. The bodies are also washed off frequently during the day with a hose and are rinsed out several times daily and oftener in warm weather.

The drivers are to a large extent responsible for the mixers and are thoroughly familiar with the operating and maintenance manual. This responsibility is carried so far that if a driver is absent from work for a short period the company prefers to have his truck stand idle rather than to have someone else drive it.

An Unsurpassed Record of Operating Performance Is the Proud Boast of J&C Brick Machines



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Sturdy, dependable, durably built to "take it" these machines are the backbone of permanently profitable brick business. Brick made plain or with frog, WITHOUT PALLETS.

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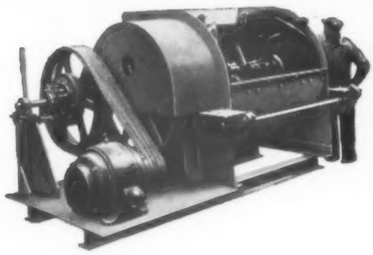

MULTI-MIXERS are supplied in either motor drive or geared-head drive eliminating pulleys and clutches. Reverse screw-type mixing action insures better concrete. All are SKF ballbearing equipped, with double seal ring packing bearings, etc., to eliminate the entrance of dirt. Abrasive-resisting steel or chromium plated liners available. Capacities from 5 to 60 cubic feet. Ask us for the names of well-satisfied MULTI-MIXER users. *Write Today for Complete Information!*

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We are in position to give reasonably prompt service on all orders. However, we regret that we are unable to supply new equipment unless a priority rating high enough to permit us to re-supply ourselves with the necessary steel accompanies your order. If you will supply us with your priority rating when ordering, it will aid us materially in determining our ability to serve you.

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ELMORE OHIO

WHY and HOW to Keep Your Jaeger Truck Mixers Rolling to Victory

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With the economic value of the truck mixer established, and raw materials abundantly available, operators face a bright future—*provided they can continue to maintain satisfactory service to concrete users with their present truck mixer fleets.*

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They're engineered for long life, low upkeep—self-cleaning drums without pockets or corners, simple and trouble-free water system, shock-proof 2-speed transmission, better mounting and weight distribution, highest type automotive construction thruout. As near as your telephone is a Jaeger distributor with complete stocks of repair parts. Jaeger traveling engineers are on call to help you with major problems.

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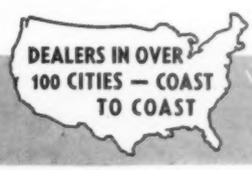
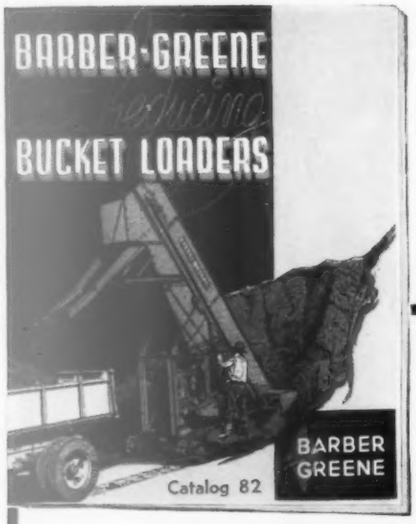
Now that war regulations limit the building of new truck mixers, we recommend two maintenance measures:

1. Make every driver responsible for his unit. Send for Jaeger Instruction Manuals and insist on careful operation and daily cleaning and lubrication as specified.

2. ARRANGE WITH YOUR JAEGER DISTRIBUTOR FOR A REGULAR 30-DAY CHECK-UP ON EVERY MACHINE.

THE JAEGER MACHINE COMPANY
602 DUBLIN AVENUE, COLUMBUS, OHIO





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Q-82

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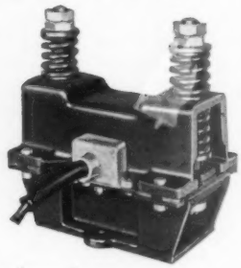

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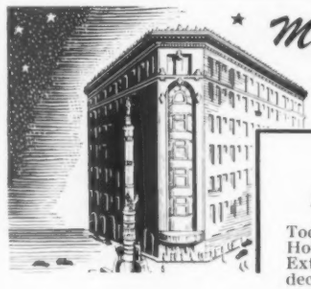

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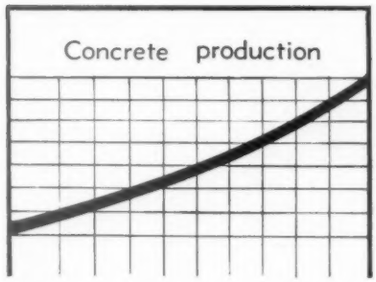

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CHECK ENGINE LUBRICATING OIL TWICE EACH SHIFT

Oil should be checked after machine is stopped and oil has drained back into oil pan. Add oil if necessary. Oil filters should be drained and filters serviced at intervals prescribed by engine builders. (Engines without filters should be drained every 50 hours). Oil screen in crank case of engine should be examined every month and cleaned if necessary.

LUBRICATE CRAWLERS AFTER EACH SHIFT

Grease crawler tread rollers every eight hours regardless of distance traveled or every half mile if they are in continuous operation. Keep crawler treads properly adjusted—never work machine with a loose crawler belt.

SEE THAT OIL OR GREASE REACHES EVERY PART THAT REQUIRES LUBRICATION

When a shaft, gear or clutch is in such position that greasing or oiling is impossible, operator should take time to turn machinery over so that every part may be properly lubricated. Oil lines to inner bearings should be inspected often, as vibrations sometimes loosen line connections. *Lima Locomotive Works, Incorporated, Shovel and Crane Division, Lima, Ohio.*

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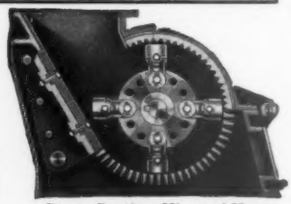

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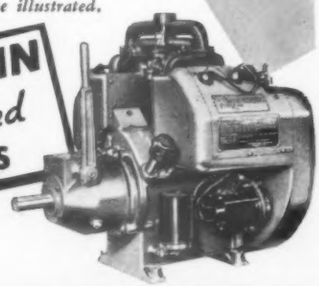

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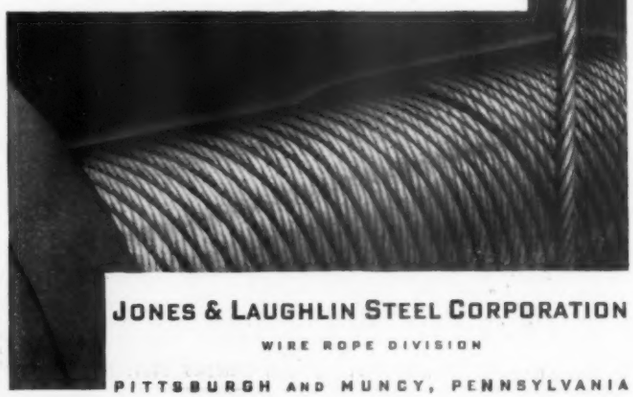

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Standard designs or special buckets to your order. Skilled service in a small but well-equipped plant specializing in replacement buckets. Large or small orders given prompt and individual attention. Write for prices.

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Half-Century of Dependability

For ACCURACY ENDURANCE ECONOMY

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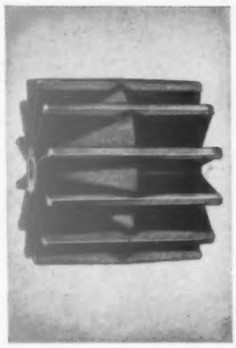
Standard and Special Weaves

TWIN CITY IRON & WIRE CO., St. Paul, Minnesota



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THE LIFE OF CONVEYOR BELTS!

The most profitable investment in conveyor equipment! A pulley that saves at least 50% in conveyor belts! This exclusive Sprout-Waldron development prevents material from coming between the face of the pulley and the belt . . . eliminates the heavy friction wear and punching of holes. Interchangeable with standard pulleys. *Write for list of sizes available.*

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ELEVATORS, CONVEYORS, POWER TRANSMISSION EQUIPMENT

DIAMOND BALANCED VIBRATORS

DIAMOND

Violent vibration for fast, positive separation *all over* the screen —controlled by accurately balanced design for smooth action. Long life, low maintenance costs. No choke. Fast delivery. Tell us your needs. Write for Bulletin D42V.

11 Sizes in 1-2-2½-3-4 Decks

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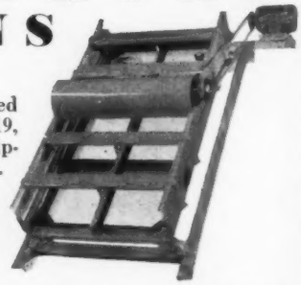
Complete line of—

Tried, Proved and Guaranteed Vibrating Screens. Since 1919, the BEST in screening equipment at the LOWEST COST.

NEW! 32-page Catalog on Screens and Screening. Just ask for Catalog No. 107.



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McLANAHAN EQUIPMENT

for ROCK— SAND—GRAVEL

Single and double roll and jaw crushers, hammer mills, super dry pans, steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists. Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

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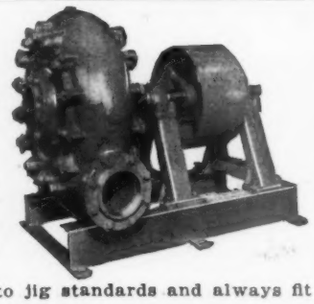
Sand and Gravel Pumps
HEAVY-DUTY (Ball-Bearing) and Low Head Types



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For 30 years LIGHTNING pumps have faithfully performed the work they are intended for. We manufacture a type and size to fit the need. Simplicity of design and ease of handling have made these pumps one of the most popular. Write for catalog now.

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SQUARE
SQUAROUND*
HEXAGON
PERFORATED PLATE
of every description
for maximum productiveness from your vibrating screens.
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The new model GAYCO Centrifugal air separator makes possible the uniform and increased recovery of cement, lime and any other finely ground metallic or non-metallic material within a range of 80 to 400 mesh.

- Greater Capacity
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Manufacturers also of "Reliance" Crushers, Screen, Elevators, Conveyors, Bin Gates, Grizzlies. Complete crushing, screening and washing plants for crushed stone, sand and gravel.

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To consider the many advantages gained by installing Simplicity Gyrating Screens.

To check the many features of the Simplicity Gyrating Screen; such as the solid counter-balanced shaft; resilient corner supports, double crowned screen decks, and many others.

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At the many successful installations of Simplicity Gyrating Screens and observe their capacity and screening efficiency.

At the finished details of construction where nothing has been omitted to make the Simplicity Gyrating Screen a complete job.

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To all arguments pro and con; then buy the screen with the lowest ultimate cost per ton of material handled, which will be the Simplicity Gyrating Screen.

SIMPLICITY ENGINEERING CO.
DURAND MICHIGAN

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KEEP YOUR BELTS RUNNING

1. Inspect your belts and fastenings frequently.
2. If you find that the lacing is badly worn and the belt joint is badly frayed or worn relace the belt with Alligator Steel Belt Lacing.
3. Don't throw worn belting away. Worn belting can be reconditioned or you can easily make up a serviceable belt by cutting out the best sections of old belts and then splicing them together with Alligator Steel Belt Lacing.
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5. Where belts are to be laced that are wider than the standard lengths of 6, 8 or 12 inches, Alligator Belt Lacing is available in continuous lengths for any width of belt. The continuous length is easier to apply and makes a more uniform and longer lasting joint.
6. Write for our Bulletin A-60 that gives complete details on how to lace flat belts of leather, rubber, balata, canvas, from 1/16" to 5/8" thick and as wide as they come.

JUST A HAMMER TO APPLY IT

• Lacing can be applied right at the location of the belt without even taking the belt off the line shaft. Alligator has strength with long life, compression grip, is smooth on both faces and the joint is easy to take apart at any time regardless of the amount of wear.

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TRADE MARK REG. U.S. PAT. OFFICE

STEEL BELT LACING

For more than 30 years the most universally used steel belt lacing in the world.

—STACKER—

FOR HIGH STOCK PILING OR SPOIL

165′ boom—5 ton aluminum car (counter balanced).
250 HP Hoist Motor.
All electric with cab control. Caterpillar mounted with individual travel and steer motors.
Ideal for disposing of material from short-boom shovel.

Address inquiries to—

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8 ton Whitcomb 36″ gauge gasoline locomotive
4 ton Vulcan 36″ gauge gasoline locomotive
30″ gauge Mercury storage battery locomotive
24″ gauge and 20″ gauge flat cars
3 electric car pullers
Generators for Hummer screens
Centrifugal Water pumps, motor, bins & tanks
Revolving dryer, 4′ x 21′ with 18″ flue

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10½″ x 21″ New England jaw crusher
11″ Traylor "Bulldog" jaw gyratory crusher
Williams No. 2 "Regular" type hammermill
Williams No. 2 "Semi Vulcanite" type hammermill
Sturtevant No. O Rotary Fine crusher
Allis-Chalmers 42″ x 16″ type "B" crushing rolls
Heavy Duty 24″ x 38″ roll crusher
Simplex Unit Coal Pulverizer, type 33A
Single roll 24″ x 24″ crusher with knobs
36″ x 30″ American Standard double roll crusher
18″ x 24″ x 30″ American Standard Disintegrator

SCREENS, SAND TANKS

4 revolving screens, 2′ x 8′, 30″ x 12′, 3′ x 8′, 4′x 16′
Several Hummer vibrating screens, single and 2 deck
2 Jigger double deck 2′ x 5′ vibrating screens

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50′ elevator with 16″ steel buckets on chain
40′ elevator 12″ malleable buckets on chain
50′ elevator with 20″ malleable buckets, 2 strand chain
40′ encased elevator, 8″ malleable buckets on chain
25′ elevator with 6″ malleable buckets on chain
6—25′ bucket elevator, 4″ and 5″ buckets on belt
35′ continuous elevator 30″ buckets, 2 str. chain
2000′ 6 ply 20″ elevator belt with 18″ grain buckets
Gears, sprockets, elevator and driving chain
Malleable, Salem, Continuous buckets, 4″ to 30″

BELT CONVEYORS

36″ trough belt conveyor up to 300′ with belt
30″ trough belt conveyor up to 150′ with belt
42″ trough belt conveyor up to 260′ with belt
54″—42″—36″—30″—20″ conveyor belt
70 cast head and tail pulleys with shafts & bearings for 36″ conveyor belt
Head and tail pulleys for belt conveyors
Cast iron and steel driving pulleys

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14 x 12″ Chicago Pneumatic, 100 hp slip ring motor
4 cyl. Schramm, 360′, with 60 hp motor, V belts
Ing. Rand portable 275′ with 50 hp Waukesha engine
Curtis 2 stage, 200 lb., 11.5′ with 5 hp motor

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136 Coit St. **Irvington, N. J.**

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P & H 700 Crane, Shovel, Dragline, 1½ yd. cap.
P & H Model 600 Shovel, 1 yard capacity
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Bucyrus Erie Model 50B, 2 yd. comb. Shovel-Crane
Bucyrus Erie Model 41B Steam comb. Shovel-Crane
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Marion Model 460 Electric Shovel, 1½ yard
Marion Model 90 Steam Shovel, 3 yards
Marion Model 32, 1½ yard Steam Shovel
Ind. Brownhoist 10 ton cap. Crane, gas, 40′ bm.
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Koehring Shovel Front, ¾ yard
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SPECIALS!!

Complete Ready-Mix Concrete Plant
2—Steel Stiff-leg Derricks, 10 tons, 100′ bm.
Allis-Chalmers cent. pump, electric, 3500 GPM. 50′
Worthington 8″ cent. bronze impeller, elec. Pump
Dredge Pump 10″ FH. cent. 200 HP. AC motor
Butler 16 cu. ft. Asphalt Pug Mill

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2 yd. Hayward Clamshell, rehandling
1½ yd. Williams Clamshell, rehandling
⅝ yd. Williams Clamshell, digging
½ yd. Owens Clamshell, digging
2—½ yard Haiss Clamshell, rehandling
⅜ yd. Haiss Clamshell, rehandling
Erie ¾ yd. Clamshell, rehandling

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RD7 Tractor, rebuilt. No attachments
2—RD6 Tractors with bulldozers
Allis Chalmers K Tractor with Baker bulldozer
International TD40 Tractor with bulldozer
Cletrac 30-40 Tractor with bulldozer

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I.R. belted 900 cu. ft., 600 cu. ft., 528 cu. ft. Portable 310 cu.; Sullivan 1214 cu. ft., 1050 cu. ft. Diesel, 455 cu. ft.; Worthington 800 cu. ft.; I.R. 315 cu. ft., 2 stage, gas, Portable

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Gyratory Crushers: K.V.S. 30, 37-S, 49; Telsmith 32, 8A, 8B; Traylor 8″; McCully 13″, 8″, 6″
Jaw: 10x22, 10x24, 11x18, 12x24″, 14x24″, 16x32, 24x36, 56x84″
Complete Rock Crushing Sand & Gravel Plants

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American 60 ton, steam, std. ga.
American 50 ton, steam, Saddle Tank
American 40 ton, steam, Saddle Tank
Vulcan 16 ton, 36″ gauge, gas
Milwaukee 8 ton, std. gauge, gas
Vulcan 8 ton, std. gauge, gas
Plymouth 8 ton, std. gauge, gas
Vulcan 6 ton, 36″ gauge, gas
10—Western Side Dump Cars, 20 yds.
10—Western Side Dump Cars, 30 yds.
3—30 ton Standard Gauge Flat Cars, rebuilt

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12 Jaeger Mixers — 1941 - 1942. Mounted on Mack Chasses. Immediate Sale.

1 Butler Batching Plant — 156 cubic yard capacity. 1000 barrel ground storage cement bin.

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1—DeLaval Centrifugal Pump—6″ Inlet, 5″ Outlet 800 Gal. per min. 190′ head—1740 R.P.M.—60 H.P. 3 Phase—60 Cycle—440 V.
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Included with above pumps for starting:
1—1½″ with 1 H.P. Motor
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1—Bit sharpener No. 34 Ingersoll-Rand with accessories

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Bucyrus 50B 2 yard Steam Crawler.
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2—W. F. Mosser & Son steel rotary dryers, 72"x60" dia., 60' long, bevel gear drive, each with counter shaft and 40' steel stack

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1—W. F. Mosser & Son steel rotary dryer, 72"x60" dia., 55' long, bevel gear drive, with counter shaft and 50' steel stack

CONVEYORS

Rubber Belt Conveyors, 16", 20", 24"
Continuous Pan Conveyors, 18" Link Belt
Steel Screw Conveyors, 12", 16" in steel box
Steel Screw Conveyors, 8" in steel trough
Canvas Belt Conveyors, 30"
Thousands of feet, all lengths

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1—Ingersoll-Rand 18¼"x14"x18" horizontal duplex air compressor, belted motor drive, with 3'6"x20' riveted steel air receiver

1—Ingersoll-Rand Duplex Air Compressor, 11"x16"x18"

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2—800 HP Edgmoor Waste Heat Boilers each 200 lbs. pressure, complete with motor driven fans, economizers super heaters, and steel stacks.

3—800 HP Babcock & Wilcox Waste Heat Water Tube Boilers, 200 lbs. working pressure, complete with motor driven fans, economizer, and steel stacks

2—400 HP Babcock & Wilcox Water Tube Boilers, 200 lbs. pressure, Combustion Eng. Co. type E stokers

All complete with Blowers, Boiler Feed Pumps and Feed Water Heaters

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Over 250 steel plate storage bins and hoppers. Various sizes

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Complete machine shop consisting of 7 lathes.

2—12", 21", 3—24", 40" Swing 5', 6', 10', 12', 2—18', 22' bed. Drill press, bolt threading machines boring mill, shaper, slotting machines, planes, miller, steam hammer, etc.

1—Verticle Double Head 57" Boring Mill

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1—Allis Chalmers Fairmont Roll Crusher, 36"x60"

2—#6 Gates gyratory rock crusher

1—#6 McCully gyratory rock crusher, style K

5—#5 Gates gyratory crushers

1—Mosser rotary clinker crusher

1—#10 McCully gyratory rock crusher with extra gear, eccentric and bell

1—Jeffrey 24"x24" single roll coal crusher

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26—42" Fuller Lehigh pulverizers, each with belt idler

3—33" Fuller Lehigh pulverizers, each with belt idler

TWO COMPLETE COAL PULVERIZING PLANTS

consisting of:

4—Fuller Lehigh Pulverizers—Jeffrey 24x24 Coal Crusher, Ruggles 6'x41' Rotary Dryer, Conveyors, elevators, etc.

3—Fuller Lehigh Pulverizers—5x30 Ruggles Rotary Dryer, conveyors, elevators, etc.

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Thousands of feet of bucket elevators, all sizes of buckets, mostly all steel encased
New Buckets and Gears

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1—Penn. Iron Works, horiz. cross compound Corliss steam engine, direct conn. to 475 Kw. G. E. generator, 100 R.P.M.

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Complete with switchboard, instruments, etc.

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1—Allis Chalmers steel ball mill, 7' dia. x 30' long, spur geared, with rope drive

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2—Steam shovels, Bucyrus, 70-ton 2½ yards

1—Steam shovel, Vulcan Little Giant, 35-ton 1¼ yards

1—Double drum steam hoist, S. Flory Mfg. Co., 11"x14" duplex

3—Brookville Fordson locomotive

1—Westinghouse 60" single drum electric hoist

1—Bucyrus #40—R. steam shovel

3—Locomotive Cranes, steam driven

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6—W. W. Sly Dust collecting systems, each with exhaust fan, 10 H.P. motor and cyclone dust collector

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1—300 H.P. Electric Dynamic 500 RPM.
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3—150 H.P. Diehl Mfg. Co.
1—150 H.P. Gen. Elec.
1—125 H.P. Gen. Elec.
1—125 H.P. Gen. Elec. 550 R.P.M.
1—110 H.P. Wsghse.
1—100 H.P. Wsghse.
1—100 H P. Al. Chal. 335 R.P.M.

Hundreds of motors from 7½ H.P. up. All with starters.

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2—Howe Scales 52"x70";—Fairbanks Morse Scale 42"x42".

4—Buffalo forge blowers & exhausters.

2—Poidometers, 1—30"x4'6" and 1—20"x4'6" each with standard Hoppers and 3 H.P. motor.

Complete Stock Room Supplies, New Gears, Bearings, Belting, Conduit, Safety Switches. Complete Laboratory Pumps, Shafting and Pulleys, etc.

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1—½ yd. Universal truck crane. No. 1162 mtd. on 7½ ton Mack truck, equipped with Christie-Crawlers, with 28′ boom.

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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

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1—18″x45′ Link Belt stationary conveyor, troughing belt type, elect. or gas power.
1—24″x25′ Northern portable belt conveyor elect. power.
1—18″x46′ Smith Eng. Works, troughing type belt conveyor, elect. power.
1—14″x25′ Farquar portable scoop conveyor, gas power.

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1—30x30″ Jeffrey, single roll coal crusher, No. 1376.
1—No. 4 Champion jaw crusher, size 9x15″, Ser. No. 2606.
1—No. 2 Climax jaw crusher, size 9x16″.
1—Buchanan jaw crusher, size 10x16″.
1—Acme jaw crusher, Ser. No. 1873, size 12x20″.
1—Acme jaw crusher, Ser. No. 1686, size 9x16″.
1—United Iron Works, "Blake-type" jaw crusher, size 9½x24″.
1—Allis Chalmers, No. 5 gyratory crusher, Ser. No. 5331, opening 10x38″.
1—Austin No. 5 gyratory crusher, Ser. No. 2945, opening 12x35½″.

DERRICKS

3—Steel Guy Derricks; 1—20-ton American-Terry 90′ mast, 110′ boom; 1—5-ton Terry Guy derrick, 70′ mast, 60′ boom; 1—5-ton Insley, 75′ mast, 80′ boom; Stiff leg derricks; 1—2-ton Pittsburgh, 26′ boom, 15′ mast. Also a number of wood stiff leg derricks, 1 to 5 ton cap.

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55—Electric ranging from 20 HP up to 125 HP, consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.

Gas hoists ranging from 8 to 120 HP, single, double and triple-drums; all standard makes. (38 in stock.)

Steam, ranging from 8 HP to 60 HP, single, double and triple-drums; all standard makes.

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4—7 ton Plymouth type 2, Model D L 24″ gauge locomotives power gasoline engines.
3—7 ton Whitcomb type MO 24″ gauge, power gasoline engines.
1—7 ton Plymouth 24″ gauge type 2 Model HL power gasoline engine.
1—3½ ton Plymouth 24″ gauge Model A L 105 gasoline power.
1—3 ton Whitcomb 24″ gauge type U T gasoline power engine.

PNEUMATIC TOOLS

Jack Hammers, Spades, Paving Breakers and Wagon Drills.

PUMPS (DREDGING)

1—10″ Morris sand pump, Ser. No. 86864, cap. 87 cu. yds. per hr.
1—8″ Cataract dredging pump, Ser. No. 175895, cap. 2000 GPM @ 53′ head.
1—6″ Morris dredging pump, Ser. No. 91802, cap. 1050 GPM @ 53′ head.
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1—50 ton American 4 wheel saddle tank, code boiler, standard gauge, completely rebuilt.
1—26 ton American 4 wheel saddle tank, code boiler, standard gauge, overhauled.
1—33 ton standard gauge Vulcan saddle tank, ASME Code boiler.

5—62 ft. flat cars 80,000 lb. capacity, cast steel truck frames, steel draft sills, wood superstructure, interchange condition.

Crane or Dragline Fronts for Marion 37 and Bucyrus 50-B, One Each.

1—1½ Yd. Rehandling Clamshell Bucket, Practically New.

Birmingham Rail & Locomotive Co.
BIRMINGHAM, ALABAMA

100 HP ELECTRIC HOIST

American Hoist & Derrick Company double drum Heavy Duty Electric Hoist, Serial No. 1866 complete with one Niggerhead, double ventilated brakes, cut gears; powered by 100 H.P. 220-440 volt, 3-phase, 60-cycle General Electric Induction type motor, Serial No. 5170767 with G. E. Drum Switch including six boxes of G. E. Grids and G. E. Resistors, Drum Capacity 230-ft. of ¾″ Wire Rope. Rated line pull 11,000# at 165 ft. per minute. Drums are 16″ in diameter and 29″ long, cast steel base.

Condition equal to new. Price attractive! Photograph on request.

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ALLIS-CHALMERS 18″ gyratory No. 8 K crusher.
MILWAUKEE 7-ton 30″ ga. gas locomotives (3).
MILWAUKEE 8-ton 36″ ga. gas locomotive.
DAVENPORT, VULCAN & PORTER 18-ton steam locomotives, 36″ gauge, S/T, 10x16 cyls.
PIONEER 300W portable gravel washing plant.
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1 Mast, wooden, 22'
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2 Twin City Model KEU power units, 4 cyl. 28 HP with Twin Disc Clutches

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3 Clinton 2 c.y. Agitators

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1 6' x 12' Primary Scalping

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1 Allis-Chalmers Fine Reduction crusher 6"

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87 Link-Belt Type 80, 36" Troughing Idlers
24 Link-Belt Type 41, 36" Return Idlers

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Cranes

1 LeTourneau AD-3 with steel wheels without P. C. U.

Buckets

1 Hayward Power Wheel 2 c.y. reh. clam
1 ¾ c.y. shovel bucket
1 1½ c.y. shovel bucket

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1 125 HP Fairbanks-Morse 440 V. 900 RPM
1 75 HP Westinghouse 200 V. 685 RPM
1 75 HP Gen. Elect. 440 V. 695 RPM
1 35 HP Allis-Chalmers 220 V. 850 RPM

Pump

1 Centrifugal 8" Fairbanks-Morse, Style 5813NE, Serial No. 279867 direct connected to 125 HP Fairbanks-Morse 1760 RPM 2200 V Serial 307275, motor

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2 Link-Belt Worm Speed Reducers Frame 5, Rating 5.3 HP, Ratio 17½ to 1.

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42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

Inquire For Prices - Mention Size and Lengths

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HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

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1½"	50 "	15.00
	25 "	10.00
	35 "	14.00
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I.D. Size	Length	per Length	Couplings
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	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
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2—8x10 cylinders.
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500′ Screw Conveyor, up to 12″
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Terre Haute, Indiana

TRUCK MIXERS FOR RENT

4—"Jaeger"—4 Cu. Yd. Mixers—on International Six Wheel Trucks

ARROW CONTRACTORS EQUIPMENT CO.
2020 W. Walnut Street, Chicago, Illinois
Phone Seeley 2040

NOW AVAILABLE

1—Model 35 UNIVERSAL (½ Yd.) Combination Shovel, Backhoe and Crane
1—GA-2 BUCYRUS-ERIE Shovel & Crane
1—Model 936 CEDARAPIDS OPO Portable Gravel Plant; 9x36 Primary and 3x36 Secondary Crushers; Revolving Screen and Conveyors
1—4'x10' 3 deck Allis Chalmers Vibrating Screen
1—6x7 UNIVERSAL Jaw Crusher
1—8x24 UNIVERSAL Jaw Crusher
1—8x36 UNIVERSAL Jaw Crusher
1—3x36 CEDARAPIDS Jaw Crusher
1—15x24 CEDARAPIDS Jaw Crusher, Roller Brg.
1—60"x24' TRAYLOR Rev. Screen, Pos. drive
1—72" KENNEDY Sand Classifier
1—5" MORRIS Cent. Water Pump & 40 HP Motor
2—Model 42A BARBER-GREENE Bucket Loaders
1—1500-lb. CUMMER Asphalt Plant—CHEAP
1—CEDARAPIDS semi-portable washing plant

We need all kinds of equipment—write

PATTERSON EQUIPMENT COMPANY
1468 West 9th Street — Cleveland, Ohio
CHerry 0439

FOR SALE

Complete Ready-Mix Concrete Plant with Steam Heat, Capacity 100 cu. yds. Pre-Mixed Concrete per Hour, located near St. Paul, Minnesota. Now Working and Available April 1, 1943.

Description:
Aggregate Conveyor 228' centers.
Four compartment Johnson Octagonal Bin with swivel distributor;—two compartments 35 cu. yd. capacity, two compartments 40 cu. yd. capacity.
Two Johnson Cement Storage Bins, 1600 cu. ft. capacity each.
One Link-Belt Cement Elevator, 80 ft. centers.
One 9"x15' Link-Belt Cement Screw.
One 150-gal. No. 848 Water Tank.
Four 90-cu. ft. Johnson Measuring Hoppers (Aggregate)
One 36-cu. ft. Johnson Measuring Hopper (Cement)
Five Johnson Hopper Scales, Model 5000
Four Toledo Dial Scales, 9000 lb. capacity (Aggregate)
One Toledo Dial Scale, 3000 lb. capacity (Cement)
One Ransome 84-S Mixer driven by 60-HP G. E. Ind. Motor
One Curtis Air Compressor
One 125-HP Scotch Marine Boiler, the James Liffel & Co.
Steam lines through hoppers, water tanks with steam coils and Unit heaters for building heating.
Entire plant electrically driven, complete with controls.

J. L. SHIELY COMPANY, INC.
St. Paul, Minnesota
Address: 1101 Snelling Ave. N
Telephone: Nestor 6344

FOR SALE—REBUILT EQPT.

2—Duplicate AMERICAN 0-4-0 S.T. Steam Locomotives—42 tons, Cyl. 14"x22", Tractive Power 17,410 lbs.
1—56 BALDWIN 0-6-0 Switcher Locomotive, Separate Tender, Cyl. 19"x24", Tractive Power 26,000 lbs.
1—8 Ton Standard Ga. VULCAN Gasoline Locomotive, Hand Brakes.
2—PLYMOUTH Model FL, 4 Ton, 24" Gauge Gasoline Locomotives.
1—WHITCOMB Model CS-4, 4½ Ton, 24" Gauge, Gasoline Locomotive.
1—C. H. & E. No. 11, Triplex Road Pump.
1—FORDSON Tractor — Pneumatic Tires.
1—30 H.P.—"J-B" Feed Mill.

Other Types of Equipment, Too
We are also manufacturers of Carry-all trailers, 10 to 40 Ton Cap'y.

SOUTHERN IRON & EQUIPMENT COMPANY
Plant & General Offices:
ATLANTA, GEORGIA

ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully Guaranteed. Send us your inquiries.

V. M. NUSSBAUM & CO., Fort Wayne, Ind.

For Sale — A Good Time to Buy
2 pile hammers Vul #1-MCK 9B3-McK7-Vul 400
6 Link Belt Vib. screens double deck 4x10
2 slack line cableways Beumond—streets 2 yd.
10 K & J steel air dump cars 16 yd.
14 steel tanks hor. 10,000 gals. 3 vert.
Cl. 14 Bucyrus steam cat. dragline 70 ft. 2 yd.
Electric clam 1 yd. 220 V. D/C Hayward
Kilns 7 ft. x 80 ft. 3 tire ½" steel
Dryer 7'6" x 75 ft. Christie
3W Monighan diesel dragline 2 yd. 85 ft.
A. V. Konsberg, 111 W. Jackson Blvd., Chicago

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RELAYING RAILS—Super-quality machine-reconditioned—not ordinary Relayers.
NEW RAILS, Angle and Splice Bars, Bolts, Nuts, Spikes, Frogs, Switches, Tie Plates, and all other Track Accessories.
Most sizes usually available from warehouse stocks. Every effort made to take care of emergency requirements. **Phone, Write or Wire**

L. B. FOSTER COMPANY, Inc.
PITTSBURGH — NEW YORK — CHICAGO

FOR SALE

18" x 36" Stevenson Single Roll Crusher.
9" x 36" Wheeling Jaw Crusher.
9" x 15" Phillips Jaw Crusher.
#4 Champion Jaw Crusher.
#1 Williams Hammermill Crusher.

PITTSBURGH MACHINERY & EQUIPMENT CO.
Aspinwall — Pennsylvania

STRIPPING SHOVEL

6½-7½ yd. Bucyrus
320-B Electric
90' boom

IRON & STEEL PRODUCTS, Inc.
38 years' experience
13490 S. Brainard Ave., Chicago, Illinois
"ANYTHING containing IRON or STEEL"

SCALES - VIBRATING SCREENS

Used guaranteed motor truck and warehouse scales, no priority needed. Vibrating Screens and Coal Crushers. Low prices. Immediate delivery.

BONDED SCALE COMPANY
110 Bellview — Columbus, Ohio

FOR SALE

1—18 cu. ft. Stearns Cement Mixer for cement or cinder block mix.

1—7½ HP Fidelity Motor with three V-Belts attached.

1—Miles conveyor to feed Block Machine 12 ft. long. (Used only 1 yr.—in good shape).

C. J. WENTZ
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DEPENDABLE USED MACHINES

Cedar Rapids duplex portable gravel plant
Gruendler 10x20 roller bearing crusher
Williams 15 x 18 hammermill
Haiss loader, rebuilt
Plymouth 4 ton locomotive, 36" gauge
18 x 25 self-propelled belt conveyor
Screens, washers, pumps, conveyors, etc.

TRACTOR & EQUIPMENT COMPANY
3515 W. 51st St. — Chicago, Ill.

No. 880 Universal Portable Gravel Plant, 9 x 36 jaw, double rolls, 3' x 8 ft. Simplicity Vib. Screen. Front end Hough Loader on International T-40, rebuilt.
No. 3 Williams Hammermill.
U-21 International Power Unit, 50 to 60 HP.
8-ton Whitcomb Gas. Locomotive, 24" gauge.
¾ yd. P. & H. No. 206 shovel-dragline.
1 ¼ yd. 75-B. Thew-Lorain shovel.

M. WENZEL
5322 Aberdeen Rd. — Kansas City, Kansas

COMPLETE BOILER PLANT

500 HP, 200 lb. P. ASME Code WT Boiler; Feed Water Heater; Boiler Feed Pumps; Coal Bunkers; Link Belt Ash & Coal Conveyor; Header Line; Valves; Fittings.

All Complete — Attractively Priced

H. & P. MACHINERY COMPANY
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Royal E. Burnham

Attorney at Law

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511 Eleventh Street, N. W.
WASHINGTON, D. C.

CORE DRILLING ANYWHERE

We look into the earth

PENNSYLVANIA DRILLING COMPANY
PITTSBURGH, PA.

FOR SALE

1 Sterling Centrifugal water pump model F J B. connected direct to type A 3 Wisconsin Engine, practically new.
1 Double Drum Drag Line, ¾ yard complete with cable and bucket.

HURON SAND AND GRAVEL COMPANY
R. D. 3 — Willard, Ohio

FOR SALE

A-C Gyratory Crushers No. 8K & No. 6D
1-yd. ERIE Steam Shovel, hi-lift
2—No. 33 I-R Drill Sharpeners

J. C. MARTYNS
G.P.O. BOX 297, N. Y. C.

FOR SALE

TRANSIT CONCRETE MIXERS & BATCH PLANT

1—Heltzel 200 ton 2 Compartment Bin with Scales
5—2 to 2½ cu. yd. Concrete Mixers mounted on substantial trucks
All in excellent working order.

THE F&Y BUILDING SERVICE
Columbus, Ohio

FOR SALE

One (1) Model 42A Barber-Greene Bucket Loader with 4 cyl. Buda Engine (Rebuilt). Chains and buckets good. Disc type feed. Tracks will need some repairs. Price—$1100.00 F. O. B.

Box 520
PIT & QUARRY PUBLICATIONS
538 S. Clark St. — Chicago, Ill.

FOR SALE

2", 1½", 1¼", 1⅛" and 1" PLOW and IMPROVED Plow steel Wire Rope; for DREDGING, Drag Lines, Cableways, etc.
60", 48", 36" and 30" Rubber Conveyor Belts; NEW and slightly used.
2—12 Ton Locomotive Steam Cranes.
Scotch Marine, Economic, Upright and Locomotive Type, Boilers; HIGH and low pressure.

Destination immaterial; attractive prices.

Box 524 Pit and Quarry Publications
538 S. Clark St. — Chicago, Illinois

1 60 Cat & Bulldozer	$ 550.00
1 30" Stedman Impact Crusher (like new)	1800.00
1 Universal Sand Drag	400.00
1 No. 8 Gates Gyratory Crusher Curved Head and Concaves	450.00
1 No. 3 Telsmith Gyratory Crusher	550.00
1 ⅜ yd. Orton Crane, Fairlead and Tagline attachments	2600.00
1 1¼ yd. Page Dragline Bucket	300.00

IRVING BROTHERS GRAVEL CO.
RR1 — Jeffersonville, Ind.

FOR SALE

Street Brothers Slackline Cableway: Two speed double drum Slackline hoist. 100 H.P. General Electric Slip Ring Variable Speed Motor. Mounted on Hoist with G. E. Controller, Resisters and Banked Levers. 80 ft. Steel Mast. Blocks, Cables with 1½ and 2 Cubic Yard Back Dump Buckets. Machine and Cables in first class condition. Reason for selling, deposit mined out. Further information gladly furnished.

DAWES SILICA MINING COMPANY
THOMASVILLE, GEORGIA

EQUIPMENT AVAILABLE IMMEDIATELY

BALL AND TUBE MILLS

2—UNUSED 7'x23'9" Tube Mills, iron lined, each including 400 H.P., 3/60/2200 v. slip ring motor and starting equipment.
1—5'6x21' Smidth Tube Mill, iron lined.
2—5'x20' Bonnot Tube Mills, silex lined, cast steel heads for direct gear drive.

DIRECT HEAT ROTARY DRYERS

3—4'x30' Ruggles-Coles, now at Rochester, N. Y.
1—5'6x24' Iroquois, made by Lancaster Iron Works. At Newark, N. J.
1—5'x30' Cummer. Now at Newark, N. J.
2—6'x50' Traylor Eng. & Mfg. Co.
4—5'x40' Ruggles-Coles, single shell. Now at Boston.

RAYMOND PULVERIZERS

3—4 roll low side Mills, each with fan, cyclone, inter-connecting piping.
1—5 roll high side type, with "whizzer" separator and everything complete, including motors, steel supports, etc.

HARDINGE CONICAL BALL MILLS

1—4'6x16" iron lined, with A.C. motor and silent chain drive.
1—6'x22" iron lined, with silent chain drive, with or without motor.

ROTARY KILNS

2—8'x125' Vulcan Iron Works.
1—7' & 8'x80' Traylor.
4—5'6 x 7' x 80' Vulcan and Reeves.
1—5'x50' Vulcan.

CRUSHING ROLLS

1—20"x14" Sturtevant, full balanced type.
1—Set 36"x16" Sturtevant.
2—40"x16" Colorado Iron Works.
1—42"x16" Allis-Chalmers.

WASTE HEAT BOILER PLANT

4—750 H.P. Edgemoor Waste Heat Boilers, all ASME, last insured for 200 lbs. working pressure. Including super-heaters, economizers, fuel fans, boiler feed pumps, steel stacks, feed water heater, etc. All in one installation and in good operating condition

FOR 25 YEARS A SYMBOL OF CONFIDENCE

CONSOLIDATED PRODUCTS COMPANY, INC.
17-19 PARK ROW NEW YORK, N. Y.
Shops and Yard at Newark, N. J., cover eight acres.

FOR SALE

One (1) 150 H.P. Thomas Single Drum Electric Hoist.
Drum 60" Dia., 36" Face, Grooved for 1" Cable, 8" Shaft, Brake Drum 67½" Dia., 9" Face—G. E. Emergency Brake. G. E. Slip Ring Motor, 150 H.P., 3 Ph., 60 C., 440 V., 720 R.P.M., Serial No. 5196349 with electric drum controller, disconnect switch, magnetic contactors and resistor bank all mounted on one frame 76" x 13'6". Condition same as new.
One (1) 100 H.P. Flory Single Drum Hoist. Drum 48" Dia., 42" Face, Grooved for ⅞" cable, 4⅜" shaft, with Falk 9-D-A Reducer 870 R.P.M., Ratio 11.5 to 1, and Westinghouse 100 H.P. Motor, 870 R.P.M., 60 C., 440 V., 3 Ph., A-1 Condition.
One (1) 8 Ton Plymouth Gas Locomotive, 36" Ga., Type 6, Model DLC., Condition A-1.
(22) 4 Yard Koppel Rocker Dump Cars—Condition good.
One (1) 36" x 12' Stephens Adamson Apron Feeder, Style D.
One (1) Link Belt Apron Feeder. 8' Centers, 18" Wide with ¼" steel pans.
One (1) 18' x 18" Jeffrey Apron Feeder.
One (1) Studebaker Dempster-Dumpster truck. 2½ ton Capacity, 1938 Model, complete with five boxes.
One (1) Diamond T Dempster-Dumpster Truck. 2½ ton Capacity, 1938 Model, complete with five boxes.

THOMASVILLE STONE & LIME CO.
Thomasville, Pennsylvania

CONSTRUCTION MACHINERY & SUPPLIES

Barber Greene No. 42 Loader, Rebuilt
1¼ Yard Page Dragline, Class C, Bucket, rebuilt
⅞ Yard Blaw-Knox, Material Handling Clamshell Bucket, Rebuilt
1 Yard Erie, General Purpose, Clamshell Bucket, Rebuilt
¾ Yard Erie, General Purpose, Clamshell Bucket, Rebuilt
1 Yard Owen, Type J, Material Handling, Clamshell Bucket, Rebuilt
½ Yard Lakewood, Material Handling, Clamshell Bucket
8x14 Universal Crusher, Rebuilt
4" Swabey Centrifugal Pump, Rebuilt
2x2½ Buffalo Water Pump, Rebuilt

YATES MACHINE WORKS
115 Main Street Rochester, Michigan

LOCOMOTIVES

Std. Gauge
1—30 Ton Saddle Tank
3—35 Ton Saddle Tank
1—40 Ton Saddle Tank
2—70 Ton Six Wheel Switchers
1—42 Ton Consolidated (Oil)
2—46 Ton 10 Wheel Type

CARS

150—30 Ton Flat Cars
150—30 Ton Box Cars

WHEEL PRESSES

2—400 Ton Caldwell No. 27

CRANE

1—10 Ton Osgood 8 Wheel Locomotive Crane, ASME Boiler

Railway Accessories Company
Carew Tower Cincinnati, Ohio

COMPLETE STONE CRUSHING
or
SAND and GRAVEL PROCESSING SERVICES
available on tonnage basis
We will install NEW, MODERN portable or semi-portable plant in any practical location. Capacity 100 to 150 tons of stone per hour or 150 to 200 tons of sand and gravel per hour.
Estimates Furnished Without Obligation
Address
CONTRACTORS SERVICE CORP. Camp Hill (suburb of Harrisburg), Pa.

MODERN RECONDITIONED EQUIPMENT

FOR SALE WITHOUT PRIORITY

CRUSHERS - SCREENS

2' SYMONS Coarse Bowl
15x24 Jaw Crusher
36"x48" Jeffrey Spike Rolls
48"x12' 2 Deck SYMONS Screen
48"x6' 1 Deck SYMONS Screen
42"x18" Trommel Screen

PAVING EQUIPMENT

3000 lb. Portable Asphalt Plant with Dryer-Scales-Motors
BARBER GREENE Travel Plant Heavy Duty—nearly new
BLAW-KNOX Cement Finisher Double Screed-Gas Electric

Also Scales—Road Rollers—Batch Bins—Conveyors

LARGE STOCKS—IMMEDIATE SHIPMENTS

BROWN-BEVIS EQUIPMENT COMPANY
4900 Santa Fe Ave.—Los Angeles, Calif.

Shovels & Cranes

1¼ yd. Osgood Shovel with 55' Crane Boom, 4 cylinder Leroy Engine.
¾ yd. Buckeye Shovel, 4 cylinder Waukesha.
¾ yd. Orton Crane, 4 cylinder Waukesha, 40 ft. Boom.
⅝ yd. Insley, 4 cylinder Buda motor.
½ yd. General with 6 cylinder Waukesha.
⅜ yd. Byers ¾ swing with 4 cylinder Hercules motor.
Universal Truck Crane mounted on Mack Truck.

Crushers, Jaw and Gyratory

2—24x36 Farrel Jaw Crushers.
2—18x36 Farrel Jaw Crushers.
1—18x36 Acme Jaw Crusher.
2—15x30 Farrel Jaw Crushers.
2½ Climax Jaw Crusher.
12x24 Champion Jaw Crusher.
10x20 Acme Jaw Crusher.
9x18 Reliance Jaw Crusher.
13A Telsmith Gyratory Crusher.
37 Kennedy Reduction Crusher with motor.
23 Austin Gyratory Crusher.

Roll and Rotary Crushers

40x16 Allis Chalmers, smooth rolls.
26x20 Kennedy, smooth rolls.
22x12 Allis Chalmers, smooth rolls.
10x16 New Holland double roll Crusher.
10x12 New Holland double roll Crusher.
21 Sturtevant open door Rotary Crusher.

Screens, Vibrator & Revolving

6x10 Niagara double deck Mogul.
5x10 Niagara double deck Mogul.
5x10 Niagara single deck Mogul.
4x8 Telsmith double deck pulsator.
3x8 Telsmith double deck pulsator.
4x5 Link Belt single deck vibrator.
5'x30' heavy duty Traylor positive drive revolving.
5'x24' Traylor pinion drive revolving screen.
4'x18 Telsmith revolving screen.
42" x 14' Acme revolving washing screen.
36"x16 Acme revolving screen.

Elevators & Conveyors

30" continuous bucket Elevator belt 66' center.
24" continuous bucket Elevator double chain, steel frame 75' center.
18" continuous bucket Elevator belt, 72' center.
18" continuous bucket Elevator 35' center.
16" continuous bucket Elevator manganese chain, 40' center.
13" continuous bucket Elevator chain, 28' center.
13" continuous bucket Elevator chain, 24' center.
12" centrifugal discharge, 46' center.
12" centrifugal discharge, 60' center, heavy duty chain.
12" centrifugal discharge, 35' center, steel enclosed.
8" centrifugal discharge, 30' center.
Also a lot of chain and sprockets for different Elevators.
160'—30" Belt Conveyor, no frame or belt.
200'—24" Belt Conveyor, no frame or belt.
120'—24" Belt Conveyor, no frame or belt.
170'—18" Belt Conveyor, no frame or belt.
80'—18" Belt Conveyor, channel iron frame and belt.
30'—16" Belt Conveyor, channel iron frame and belt.
Also a lot of 18"-24" and 30" Belt Conveyor Idlers, ball and roller bearing.

Pumps, Centrifugal & Pressure

6" Allis Chalmers centrifugal pump, 170' head, 1500 G.P.M. 75 hp. motor.
3" Lawrence centrifugal, 180' head, 250 G.P.M. 15 hp. motor.
2½ Penna. centrifugal pump, 120' head, 200 G.P.M. 10 hp. motor.
3x5 Myers Piston high pressure pump, 500' head, 500 lb. pressure, 3 hp. motor.
3x3 Myers piston well pump, 1 hp. motor.
3 piston pressure pumps, belt drive.

Hoists, Single & Double Drum

Mead-Morrison 2 yd. drag line hoist #18552.
Mead-Morrison 1 yd. drag line hoist #9155 with 10 hp. motor.
Mead-Morrison 1 yd. drag line hoist #13566.
Sauerman drag line hoist.
30" diameter single drum mine hoist.
18" diameter single drum friction hoist.

Miscellaneous

1—60 caterpillar Tractor with Bulldozer.
1—Gallion Grader on caterpillars.
6—heavy duty Bin gates, cast iron.
1—Acytelene cutting outfit, complete.
130'—8" pipe, 70'—6" pipe, 120'—3" pipe.
1 Tank 12" diameter 22' long.

Phone Leesport 100

FRANK A. KREMSER & SONS, INC.
R. D. #2, Reading, Pa.

Night Phone Reading 42521

FOR SALE

Burial Vault Business, suitable for concrete products manufacturing.

Factory and five acres of best gravel, doing good business, all equipment up to date. Ill health forces me to sell for cash only.

Write

Box 536

PIT AND QUARRY PUBLICATIONS

538 S. Clark St. Chicago, Ill.

FOR SALE

1—SAND & GRAVEL DREDGE, steel construction, 14 x 40' pontoon, 25' rotary cutter, 70 HP Hercules Eng. 6" H&B pump, V belt driven, quick dump stone trap, 5 drum hoist, spuds, priming pump all complete. Bargain.

1—150 HP DOUBLE DRUM HOIST direct connected to two speed motor with all electrical controls. Used very little.

1—UNIVERSAL CRUSHER 8 x 24" with 28' elevator mounted on truck. Good condition $2000.00

WANTED — No. 2 or No. 3 Symons cone crusher or crusher equivalent thereto.

C. D. SMELSER CONST. CO.
130 N. Lafayette Blvd. South Bend, Indiana.

---

5 YD. MARION STEAM SHOVEL FOR SALE

Model 92, purchased new 1924, converted to Bucyrus-Erie caterpillars about 1928; Steam Boiler is now oil-fired, having been converted from coal in 1940; burns No. 5 fuel oil. Oil burner is a Best model 2N, equipped with Best steam qualifier, incl. gauge, drip cock, strainer & trap. 30'2" Boom; Many spare parts included. Machine has been in operation up to the present time. $5,500.00.

Write Box No. 320

PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

PRICED FOR QUICK SALE

1—Link Belt Shovel Boom Assembly with 1 yard Amsco dipper, excellent condition, will fit models K1, K2, K35, K42 .....$750.00

1—Allis-Chalmers Blake Type Jaw Crusher 10"x20" $800.00

LIPPMANN ENGINEERING WORKS
4603 West Mitchell St. Milwaukee, Wis.

FOR SALE

9x36 Wheeling roller bearing crusher in very good condition	Price $900.00
1—6x36 Reduction crusher Universal	like new Price $750.00
1—¾ cu. yd. electric cableway	Price $2500.00
1—1 cu. yd. electric cableway	Price $3000.00

Call or Write

RAY J. IRVING
2114 California Ave. Ft. Wayne, Ind.

MAN—with mechanical ability for managerial position in a New England lime company. Fully familiar with quarry and plant operations, consisting of lime burning, crushing, pulverizing, and hydrating of chemical, building and agricultural limes.

BOX 532

PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

FOR SALE

2 Direct Connected pumping H & B Manganese Units Caterpillar Gas Powered.
1 Shovel Front for Model 204 P & H Excavator.

WANTED

8" Morris—Late Model, 8" Amsco Counterflow pump, and 8" Diamond—Late Model—without power.

ORAN S. CALVERT
Lawrenceville, Illinois

WANTED

1½ or 2 yard — new style Dempster Dumpster or Brooks Load Lugger, with four or five buckets, and power take-off for 1941 Ford.

BOX 528

PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

Position wanted, as Quarry Supt., or Quarry Manager, young man with 17 years experience in quarry operation and management, including Transit mix, Concrete plants and Bituminous Asphalt plants with combined production of more than one-half million tons per year. Can furnish excellent references.

Address Box No. 504
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

WANTED

1 Allis-Chalmers Com-Pet 3' 6" by 12' Ball Mill

Casellini-Venable Corporation
Barre, Vermont

POSITION WANTED

Superintendent or technical advisor in lime or cement plant operation. 20 years experience in maintenance, construction, buying, selling, etc. Educated as a chemical and mechanical engineer.

Address replies to
Box 324

PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

WANTED!
16, 20, 24 or 30 cubic yard
AIR DUMP CARS
Any quantity, type, make or location.
Also 10 to 100-ton Gas or Diesel Locos.
IRON & STEEL PRODUCTS, INC.
38 years' experience
13490 S. Brainard Ave., Chicago, Illinois
"ANYTHING containing IRON or STEEL"

WANTED

1 Used 10-Yard Monighan Shovel or equal. Prefer Straight Electric, consider Straight Diesel. Must be A-1 Condition.

Box 512

PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

WANTED

Young man with suitable technical education, for Cement Plant superintendent or assistant superintendent; Cement Plant Experience preferable but not necessary. Please submit complete statement of qualifications and experience with photograph in first letter.

Box 516

PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Illinois

WANTED

Used shovel, dragline, crane, back hoe or any other kinds of used machinery. Also suction dredger or clamshell dredger, tug boats, barges, used dredge pipe, wire rope cats., used dump trucks.

Fred V. Menge

WESTERN DREDGING & CONT. CO.
Box 3051 Juneau, Alaska

RECONDITIONED
TRUCK MIXER FLEET

6—4-yard Jaeger Separate Engine Drive Truck Mixers mounted on A.C. Mack trucks

2—3-yard Blaw-Knox Separate Engine Drive Truck Mixers mounted on B. F. Mack trucks—1937

2—4-yard Blaw-Knox Separate Engine Drive Truck Mixers mounted on A. C. Mack trucks

1—6-yard Jaeger Separate Engine Drive Truck Mixer mounted on Model DC 100 Autocar with dual range transmission—1940

4—12-yard Heil steel dump bodies with hoists

Immediate Delivery

THE JAEGER-LEMBO MACHINE CORP.
Northern Blvd., at 127th Street
Corona, L. I., N. Y.

DREDGE FOR SALE

This Dredge has been moved to Richmond, Virginia but is available on short notice.

J. B. & J. W. ROBERTS
P. O. Box 34
Richmond, Virginia

CENTRIFUGAL PUMP
500 GPM. 150' head Aurora 4" pump dir. con. 40 HP. 1700 RPM. 230 V. DC motor

DC GENERATORS
35 KW. 115 Volt, 720 RPM. Allis Chalmers
75 KW. 250 Volt, 500 RPM. Northern 2 brg.

AC GENERATORS
80 KW. 900 RPM. 3/60/240, Fairbanks Morse
150 KW. 600 RPM. 3/60/220, General Electric
150 KW. 225 RPM. 3/60/2300, Ft. Wayne 2 brg.
200 KW. 720 RPM. 3/60/240, General Electric

AC MOTORS
35 HP. 720 RPM. 3/60/220, General Electric
40 HP. 1800 RPM. 3/60/2300, General Electric
40 HP. 1200 RPM. 3/60/2300, General Electric
40 HP. 600 RPM. 3/60/440, General Electric
75 HP. 720 RPM. 3/60/440, General Electric

GASOLINE ENGINE
10 HP. 350 RPM. Fairbanks Morse Type Z

ROCKFORD ELECTRIC EQUIPMENT COMPANY
726 South Wyman St. Rockford, Illinois

STANHOPE OFFERS!

AIR COMPRESSORS
MELTED: 355, 528, 676, 1000, 1300 & 1570 Ft.
ELECTRIC: 478, 676, 807, 1302, 1723 & 2850 Ft.
DIESEL: 105, 315, 420, 603, 807 & 1000 Ft.
PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft
STEAM: 49, 310, 528, 1300 & 2200 Ft.

BUCKETS
50 Skips and Battleship Type, 2 to 6 Yds.
5 Owen & Bucyrus Rock Grabs.
CLAMSHELL: ½, ¾, 1, 1½ & 2 Yds.
ORANGE PEEL: ¾, 1, 1½, 2 & 3 Yds.
DRAGLINE: ½, ¾, 1, 1½ & 2 Yds. Cap.

CRANES & DRAGLINES
5 Ton BROWNHOIST, 30 Ft. Boom Gas.
12 Ton NORTHWEST 50 Ft. Boom Gas.
12 Ton KOEHRING 45 Ft. Boom Gas.
16 Ton Speedcrane, Gas, 50 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Locomotive.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.
2½ Yd. Lorain Model 95, Diesel Dragline.
3 Yd. Monighan Diesel Dragline.
5 Yd. Monighan Diesel Dragline.

CATERPILLAR SHOVELS
½ Yd. P. & H. Gas & ¾ Yd. Insley Gas.
¾ Yd. KOEHRING Gasoline.
¾ Yd., 1¼ Yd., 2 Yd., 4 Yd. & 8 Yd. MARION Electrics.
1 Yd. NORTHWEST Gas & 7/8B2 Steamer.
1¼ Yd. BUCYRUS 41B Steamer.
1½ Yd. Lima 750 Diesel.
1½ Yd. KOEHRING 601—Gas.

DUMP CARS
46—KOPPEL 1½ Yd., 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd. 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.

BALL, ROD AND TUBE MILLS
6x8 Continuous Pebble Mill.
5x5 Batch Mill.
5'x22" HARDINGE CONICAL Dry Ball Mill.
6'x22" HARDINGE CONICAL Pebble Mill.
4x8, 8x6, & 10x9 Straight Ball Mills.
8'x22" HARDINGE CONICAL Ball or Pebble Mill.
4x16, 5x18, 5x22, & 6x22 Tube Mills.
3½x8 & 5x7 Air Swept Tube Mills.
2x41½, 5x12 and 6x12 ROD MILLS.
4x16 Smidth Tube Mill Silex.
5½x20 Smidth Tube Mill Mang. Lining.
5½x18 P & M Tube Mill Silex.

PULVERIZERS
No. 1 Sturtevant Ring Roll.
RAYMOND Auto. Pulverizer No. 0000, 0 & 3.
RAYMOND Imp Mills No. 4, 32 & 55.
GRUENDLER XXB Mill & Jay Bee No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 Ft. Chaser Mill.

SEPARATORS AND COLLECTORS
14 ft., 8 ft. and 12 ft. Separators

ROLL CRUSHERS
36x60 Fairmont Single Roll.
36x20 Diamond Double Roll.
24x24 & 36x16 & 36x20 Diamond Double Roll.

JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x18, 36x14, 36x15, 36x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42, 84x66, 36x16, 9x36,
30x10 Gruendler Roller Bearing.

CONE & GYRATORY CRUSHERS
18 in., 24 in., 30 in., 36 in. and 48 in. Symons Disc.
21K & 18N Allis Chalmers.
4—10 TZ Traylor 4 Ft. Gyratory.
4—Nos. 5, 3 & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory.
8 in. Traylor T. Gyratory, Telsmith No. 9.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½.
10 Inch Austin Model 105.
6, 10 & 13 Inch Superior McCullys.
KENNEDY: Nos. 19, 25, 27, 39 & 49.
16" Traylor.
7 Ft., 5 Ft., 4 Ft., 3 Ft. and 2 Ft. Symons Cone.

DRILLS
4—SANDERSONS 14 & LOOMIS 44.
7—Ingersoll-Rand Wagon Drills, FB & M2.
29T ARMSTRONG Well Drill.

HOISTING ENGINES
7 Gasoline 15, 40, 60 & 100 H.P.
17 Steam 7x10, 8½x10 and 10x12.
8 Electric 20, 35, 50, 60, 100 & 150 H.P.

HAMMER MILLS
4 Jeffreys: 24x18-A, 36x24-B, 42x36-E & 42x48-B.
Williams No. 1 Jumbo Jr., & No. 6 Universal.
Nos. 4, 6 & 8 Williams Jumbo.
No. 36 Am. Ring Roll.
Gruendler No. 6X.

STEEL BINS
72 Ton BLAW-KNOX 2 Compt.; also 250 ton.
100 Ton BLAW-KNOX 2 Compt.
300 Ton Johnson 3 Compt. Aggregate, 1 Compt. Cement with 2 yd. Aggregate and Cement Weigh Batcher.

SYNCHRONOUS MOTOR GENERATORS
100 K.W. RIDGWAY 3/60/2200-250-275 volt.
150 K.W. GEN. ELEC. 3/60/2200-250-275 volt.
200 K.W. RIDGWAY 3/60/2200-250-275 v., 900 rpm.

DIESEL ENGINES
60 HP Fairbanks Morse.
140 HP Fairbanks Morse.
200 HP Atlas.

DIESEL GENERATORS
240 K.W. F.M. 3/60/2300 v.
300 K.W. Worthington 3/60/2400 v.
125 K.W. F.M. 250 v. D.C.
30 K.W. Buda 110 v.

RAYMOND MILL
5 Roll High Side.

CONVEYOR PARTS
BELT: 1000 Ft. 60 In., 700 Ft. 42 In., 600 Ft 36 In., 800 Ft. 30 In., 1642 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 1000 Ft. 14 In. & 16 In.
IDLERS: 36 In., 30 In., 24 In., 20 In., 18 In.
Head & Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft. 24 In., 30 In. & 36 In. Sections.

ROTARY DRYERS AND KILNS
36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 30 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 Ft. x 16 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 70 Ft., 70 In. x 40 Ft., 5x30 & 8x84 Double Shell Dryers, 8x110, 7½x100, 8x125 & 10x20 Kilns.

STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom. 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

LOCOMOTIVES
DIESEL: 7—41½, 8 and 15 Ton 36 & 42 In. Ga.
GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton.
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 17 Ton & 40 Ton.

SCREENS
VIBRATING: 2x4, 3x6, 2x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72, HUMMER, ROTEX, NIAGARA & ROBINS, LINK BELT & HURON.
REVOLVING: 3x12, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x23, 4x24, 5x30, 5x20, 6x20.

STEEL STORAGE TANKS
35—4000, 5000, 6000, 8000, 10000, 15000 and 20000 gal. cap. Horizontal and Vertical.
50000 gal. on 100 ft. tower.
60000 gal. on 85 ft. tower.
100000 gal. on 100 ft. tower.

RAILROAD CARS
12—50 Ton Cap. Battleship Gondolas.
7—50 Ton Cap. Flat Cars.

SAUERMAN DRAG AND SLACKLINES
1— ¾ yd. Gas 1—1½ yd. Electric
1—1 yd. Electric 3—3 yd. 3 yd. & 4 yd. Electric

R. R. TRACK SCALE
125 Ton 56' x 10'6" Platform 4 Section.

WHIRLEY CRANES
5 Clyde 75 to 100 Ft. Boom.

DRILL SHARPENERS
5 I.R. 4K Shank Grinders.
6 Ingersoll-Rand 54, 40, 50 & 34's.
7 Sullivan Class A, & C.
8 Gardner-Denver 3A & No. 6DS.

CONE CRUSHERS
Symons No. 5½ and 7 Ft.

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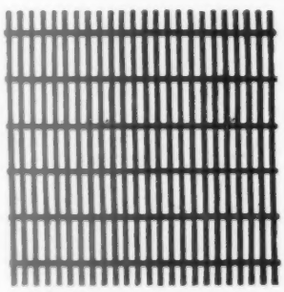

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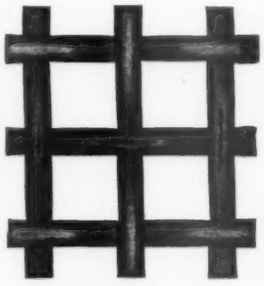

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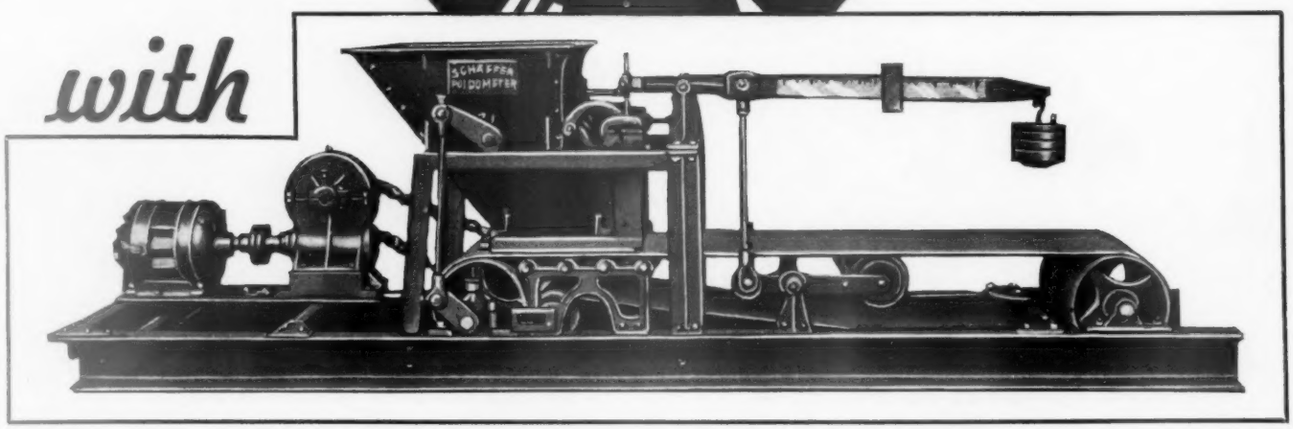

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